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QUEENSLAND AGRICULTURAL JOURNAL

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Event and Comment.

Queensland's New Governor.

BRISBANE as the gateway of the State, in its superb scenic setting and touched with the gold of a winter sunrise, looked its best on 13th June, the day of the arrival of the new Governor of Queensland. Coming up its beautiful river on a majestic Orient liner a myriad windows of homes rising to the heights from the waters edge, reflecting the morning sunlight, had already flashed a smiling welcome to Sir John and Lady Goodwin—a welcome to be expressed more warmly by the citizens themselves before the day had far advanced. The Acting Premier, Mr. A. J. Jones and Mrs. Jones were the first to offer greetings to His Excellency and Lady Goodwin on behalf of the people of Queensland. At a civic reception later in the week, at which were gathered representatives of every section of the community, the cordiality of the people's welcome was again demonstrated felicitiously. The Acting Premier (Mr. A. J. Jones), supported by other prominent representatives of the people, renewed the State's greetings. The high office of Governor, he said, had always commanded the respect of the people of Queensland. Apart from that, Sir John Goodwin came from overseas with a great reputation, and on that account alone could be assured of the goodwill and esteem of the people. He was sure His Excellency would be impressed by the wealth and prospects of Queensland. He had come here to help the citizens of the State to work out their destinies, and to surmount their difficulties, and he would carry away with him a favourable impression of the country. The disabilities of Queensland's climate were much exaggerated in the Old Country, and he could assure His Excellency

and Lady Goodwin that if there was one thing that could exceed the warmth of Queensland's climate, it would be the warmth of the welcome extended to them by its people.

The Lieutenant-Governor (Mr. W. Lennon), the Mayor of the City (Alderman W. A. Jolly), Colonel Donald Cameron, D.S.O., M.P., and Sir David Hardie joined in the citizens' greetings which were accorded so cordially.

In the course of his acknowledgment, his Excellency said that the welcome received by Lady Goodwin and himself had been overwhelming, and made him feel that his dearest wish had been realised—namely, that he should not come to Queensland as a stranger. He loved Australia, and could claim that the better part of him was Australian. For the fact that his earliest recollections were of Victoria and not of Queensland, they would have to remember his extreme youth at the time, and so forgive him. For the greater part of his life he had been in the service of the State, and so had not been able to revisit Australia as he would have liked to do. When he was offered the post of Governor of Queensland, he felt it was a very great honour. He knew a good deal about Queensland, though he had never visited it before, and he was satisfied that no country had greater potentialities, or greater agricultural and mineral resources than had Queensland. Then he knew the record of the Queenslanders in the war. It was his great regret that he had never, during the war, come directly into contact with the Australians overseas, but every one with whom he had spoken, including officers who had served with them—told him of the sterling qualities of the men from Australia. It made him proud to be able to claim kinship with such people. If the loyalty of Queensland could ever have been questioned, the record of the State during the war was the most effective reply. From its small population the State had sent 58,000 soldiers overseas to serve the Empire. He was glad that he would henceforth have the opportunity of working with the people of Queensland for the good of the State.

Our Rich North.

WHILE in Melbourne attending the Premiers' Conference recently, the Deputy Premier (Mr. W. Forgan Smith) took an opportunity, in the course of Press interviews, of dispelling some of the extraordinary illusions about Queensland that have existed in the minds of many untravelled southerners. The following points are taken from the report of an illuminating interview with the Deputy Premier that was given great prominence in the Melbourne Press:—

Queensland, he stated, is the one State whose capital is not an octopus, which claws at the vitals of the country. It is the most decentralised State of all. The drift from the land does not exist as it does in the South.

Because the country population dominates, the Government is a country Government.

Because of its wealth and its position, and even because of its problems, Queensland is the most important State in the Commonwealth.

Queensland is getting its best immigrants from the other States. It is attracting farmers' sons from New South Wales, Victoria, and South Australia. Young men are going there because it is there that they get the biggest chances.

Who has heard that more sugar to the ton comes from Queensland cane than from any in the world? This is mainly through the work of the Bureau of Sugar Experiment Stations, which has a corps of keen young scientists working the year round.

Nobody hears much about the Prickly-pear Commission. But every year it is reclaiming thousands of acres of the best land in the North.

Celotex manufacture and power alcohol extraction are promising to become valuable new industries.

When the whole of the sugar-cane residues are being used they will be supplying 8 per cent. of Australia's motor spirit.

Queensland is seriously considering migration. The Dawson Valley scheme will be one of the biggest things it has ever tackled. It is the development and opening of the Dawson Valley for irrigation farms and dry farm areas. The area suitable for irrigated farms is 1,000,000 acres, to which will be attached 200,000 acres of dry lands. About 7,000 new irrigated farms are included in the project, each a living area for an average family of five persons, producing cotton, rice, tobacco, and lucerne. When completed a great dam—to be known as the Nathan

Dam as a compliment to the late Governor of Queensland (Sir Matthew Nathan), who took a deep interest in the scheme—will impound sufficient water to supply Brisbane for more than fifty years without any rainfall during that period. One hundred and thirty square miles of country will be submerged. The scheme provides for five distinct zones of from 40,000 to 50,000 acres, each with its own township. The first of these, the Theodore zone, was opened for selection recently.

A White Man's Country.

DISCUSSING the effects of the recent Royal Mission to Australia, the Agent-General for Queensland in London (Hon. J. Huxham), remarked that the people of England are apt to conclude that the value of the tour of the Duke and Duchess of York is the effect on Australia. Actually it is the effect on England. Australian loyalty needs no stimulus. Previous Royal tours quickened English interest in Australia, which, purely and simply, is a white man's country. It welcomes, he said, the right sort of English migrants with open arms. The great welcome accorded the Duke and Duchess is the measure of Australia's appreciation. It was especially delighted with the Duchess, because she is a woman's woman. It will be splendid, he added, if the visit encourages more Englishmen to migrate to Australia, but they must not arrive in a patronising spirit. Australians, a proud people, have something to teach as well as to learn.

The Problems of the Dairying Industry.

A VISITING American dairying expert, Professor O. F. Hunziker, reviewed most interestingly some dairying problems and points in factory practice at a session of the recent conference of butter and cheese factory managers in Brisbane. He said that the longer he was in Australia the more he became convinced that the fundamental problems of the industry, particularly those of manufacturing, were very similar to those in America. Poor quality cream was the curse of the industry, and the more butter-makers had of it the worse they were off. It was their duty to see that they obtained good cream.

Speaking on the general aspects of butter manufacture, the professor said that he had reached the point where he did not consider anything impossible until it had absolutely been proved, no matter how unreasonable it might sound or appear. For instance, scientists had laughed at the farmer who insisted upon consulting the calendar, and who insisted that planting into the new moon produced bigger crops. Only recently scientists found that the farmer had been right. The first problem was that of ensuring a volume of good cream. He drew attention to the need for greater co-operation between the factories, and said that the lack of co-operation was the rock upon which their efforts towards cream improvement had been wrecked. They should say that cream of a stated quality would receive a certain price. The only reason that poor cream arrived with such exasperating regularity was because they offered the farmer a good market for the poor product. In this respect they were favoured in Australia by legislative assistance in grading and by the maintenance of a price schedule.

But quality and quantity were not the only factors. It was necessary to help the farmer to produce his cream economically. The farmer needed information on feeding, on the proper crops and how to grow them, on the management of cows, and on breeding, although feeding was often more important than selection and breeding. The final matter was that of markets, which should be profitable and permanent. In Australia—like America—they had a high standard of living and high production costs, so that the great essential was that they should produce butter of the highest quality, butter that would command the esteem and the highest price on the world's market.

Australia had relatively a tremendous butter production in comparison with its 6,000,000 population, but the farmers had to depend upon the world's market despite the efforts made to stabilise prices. Hence it was essential to produce the highest quality to secure every penny the world's market would give.

Professor Hunziker elaborated and aptly illustrated the interdependence of the four factors in butter quality—cream quality, methods of manufacture, factory equipment, and supervision or management in the factory.

Bureau of Sugar Experiment Stations.

ENTOMOLOGICAL HINTS TO CANEGROWERS.

By EDMUND JARVIS, Entomologist.

Purpose of Entomological Hints.

The first of this monthly series of entomolgical notes of advice tendered to canegrowers was published in November, 1923, and since that date these hints regarding the identification of common insect pests of sugar-cane, their probable times of occurrence, and approved methods for controlling their activities, have appeared regularly month by month in the "Queensland Agricultural Journal," "Australian Sugar Journal," and other periodicals.

The original purpose of the writer was to remind farmers of their responsibilities in connection with taking measures to fight insects likely to affect their crops.

Concerted action undertaken at the right time will go far towards minimising the extent of injuries inflicted by our more serious cane pests; and whilst not unduly trespassing upon daily work on a cane farm would tend also to benefit growers financially.

It should be borne in mind that these monthly hints apply mainly to an area of land lying within a radius of about 25 miles from Meringa Experiment Station, although primary insect pests occurring in other sugar-growing districts (such as Burdekin and Herbert River) are also included at times.

Growers desiring additional information on any point concerning the destruction of cane pests should consult the Entomologist in Charge at Meringa Laboratory; either by 'phone, or letter addressed Meringa, Private Bag, Cairns.

How to Combat Grasshoppers.

About the middle of last month (June) the common grasshoppers *Locusta danica* and *L. australis* were much in evidence in cane fields around Meringa, where later on in the month myriads of tiny hoppers appeared, these being the early larval stage of such pests.

Seeing that conditions still point to a possibility of trouble from these insects in the near future, and probably also in the present month (July), it is advisable to stress the importance of being ready to take action in the event of a sudden attack.

These insects strip the leaf blades, leaving only the mid ribs—the damage, however, being usually confined to small areas—and if taken in time not difficult to cope with.

A bait that has proved successful is made from 100 lb. of coarse bran (the coarser the better) with 4 lb. of finely-powdered Paris green, 4 lb. of cheap-grade granular dairy salt, 2 gallons of low-grade molasses, 3 oz. of amyl acetate, with 10 to 12 U.S. gallons of water; sawdust may be substituted for the bran should the latter prove unobtainable. When large amounts of this bait are being used the arsenic should be added to the liquid ingredients, instead of being mixed with the bran while dry.

For other simple and effective remedies see Hints for May ("Queensland Agricultural Journal," Vol. xxvii., p. 400; or "Australian Sugar Journal," Vol. xix., p. 118).

Remember that Like Produces Like.

Always select good healthy seed, rejecting any sets showing tunnels of the Weevil Borer (*Rhabdocnemis obscurus* Boisd.), or which may have been derived from localities known to be badly infested by this cane-beetle.

Such seed, although apparently fairly clean-looking, often harbours young larvæ, and a few weeks after planting same the latter may devour a sufficient amount of an affected set to endanger or lead to death of the young shoots later on, thus causing unsightly misses. Moreover, it is by means of such infested seed cane that these weevil borers often obtain a footing in clean localities, and once well established this pest is not easily got rid of. Apart from the danger of introducing insect pests, it always pays to use healthy cane for planting; and to see that it be free from fungus diseases. When cutting sets throw aside those showing reddish or other discoloration at the cut ends.

CANE PESTS AND DISEASES.

The Director of the Bureau of Sugar Experiment Stations, Mr. H. T. Easterby, has received the following report (10th June, 1927) from the Assistant Pathologist, Mr. E. J. F. Wood, on diseases in the Mackay district, for May.

As regards disease, the Mackay district is the least affected of any visited this year, and great credit is due to the farming community which has made it so. It must be remembered that to keep up the standard of efficiency, the efforts at disease control must not be relaxed.

Only two of the major diseases are of importance in this area—viz., Mosaic and Leaf stripe. Gum has been seen in a small area to a very limited extent, and the farmers should endeavour to ascertain the leaf symptoms, which consist of a yellow streak running along the leaf, the presence of red dots in the discoloured areas, and the subsequent death of patches within the leaf being characteristic signs. Very similar signs resulting from damage to the mid-rib of the leaf by the leaf borer, which can be readily detected as a reddish patch showing a sinuous tube beneath the surface, can be mistaken for gum streaks; but the absence of borer and the appearance of the streaks on several successive leaves serve to distinguish gum.

Leaf stripe seems also to be very limited in its distribution and the immediate eradication of the diseased stools is the control measure. These stools should be burnt, and none such should ever be planted. The leaf markings of this disease are rather similar to Mosaic, but the stripes are more definite in outline, and they gradually turn brown. On the lower (dorsal) surface of the leaves a fine white felt may be seen, if closely looked for. The affected sticks are usually elongated, and the leaves often become ribboned, whence the name Leaf Splitting Disease often bestowed on this trouble.

Mosaic is, as usual, more widely distributed than any other disease, but even this is comparatively slight except in the Farleigh and Mount Jukes areas, and is only severe in portions of these. Many farmers do not know the symptoms, but the usual method of rejecting plants which show any peculiar symptoms is to a large extent responsible for the cleanliness of this area. Several farmers have shown me such rejects and asked me what the trouble was. Only their prompt action has prevented the spread of the disease. While it is possible to keep unknown diseases in check in this manner it is always better to know the diseases, and farmers are advised to find out from their friends the symptoms of Mosaic, if they do not already know them. That most characteristic of Mosaic is a mottling of the leaf which shows patches of light and dark green, or of green and yellowish green patches according to the variety. They are just as though one had painted a leaf with a brush dipped at random in two different shades of green, painting along the leaf. The stem is often mottled and in severe cases ribbed.

Part of the freedom from this disease in this area is perhaps due to the fact that very little corn is grown on the cane farms in Mackay, in contrast with the extent of this practice in the southern and more infested areas.

All stools showing the leaf markings should be dug out in cases of light infection, and no infected stool should, under any circumstances, be planted. In both the Mount Jukes and Farleigh areas I should recommend the discontinuation of the planting of Black Innis, as this cane is one of the most highly susceptible varieties grown. Its replacement by Badila or Q. 813 where suitable, and by E.K. 28 on the hillsides, is suggested. The latter variety is rather susceptible to the disease, so rigorous selection is necessary in the case of this variety, but it would be a pity to discard this otherwise eminently suitable variety on this account, as it gives splendid results on the higher ground where so few varieties will grow well.

The greatest efforts should be made to keep the new areas at Carmila and Flaggy Rock free of the disease. A very light infection was noticed at one farm in the latter district, but the farmer seemed to have it well under control, and it is hoped that it will be quickly stamped out.

Attention of the farmers is called to the prevalence of root diseases in the whole area. While these are usually regarded as minor troubles they can collectively cause considerable loss, and reasonable care should be taken to prevent them. The farmers at Sarina recognise that Red Rot, commonly a very minor factor in cane losses, can at times prove a very serious one, and considerable trouble has been caused to the farmer by Leaf Sheath Fungus and Peg Leg, or Root Rot as it is

indifferently called. These are all secondary diseases by which is meant that some soil factor is the primary cause. These latter include—

Excessive drought and soil deficiency: These two act in the same way on the plant, as in both cases the necessary salts are unavailable to the plant.

Excessive moisture resulting in stagnant water, and sour soil giving insufficient aeration to the roots. It has been shown in India by Harvey in the case of fruit trees that drainage will relieve diseases due to sour soils.

Weeds also resulting in deficient aeration.

Soil acidity due to any of the above factors.

Soil acidity can be rectified by the application of lime at the rate of 1 to 2 tons per acre. The low quantity of nitrogen in the Mackay soils may also be a factor. Green crops should also be extensively grown, lime applied where necessary, and other deficiencies made up with B_3 or some other fertilizer. Sulphate of ammonia and nitrate of soda can be used with good effect, and the subsequent (not simultaneous) application of lime to correct the ensuing acidity is a necessary adjunct in these soils at any rate.

Greater tilth will also help, and in clayey basins the drainage of these will considerably ameliorate the root rot problem. Varietal resistance is also a controlling factor, but should only be a last resource, as it would be a shame to get rid of a good variety when other and easier methods are available for control. M. 1900 S. is the most highly susceptible to root troubles, and Q. 1098, M. 89, E.K. 28 are also affected.

These diseases can live over on the trash and on old stools, so fallowing and a rotation crop such as Giant Cowpea or Mauritius Bean become important in this connection, apart from their fertilising effect. Burning the trash in infected areas is recommended till the disease is under control. No plants showing the fungi should be put in.

It is intended that a lecture will be given on the subject of cane diseases at a field day on the 17th instant at the Mackay Experiment Station, and a collection of disease specimens will be exhibited so that the farmers will have an opportunity of learning the symptoms of the various diseases for themselves, and it is hoped that they will avail themselves of it.

FIELD DAY AT BUNDABERG.

The Director of Sugar Experiment Stations, Mr. H. T. Easterby, on his return from Bundaberg, informed the Press that the tenth annual field day of the Sugar Experiment Station at that place, held on Saturday, 28th May, was an unqualified success; the attendance of canegrowers was between 500 and 600.

Proceedings opened with an address by the Director welcoming the visitors, and an abstract of the experimental work carried out during the past year. This was then followed by an inspection of the fields of cane and cultivation and variety experiments. After luncheon an exceedingly interesting address was delivered by Mr. J. F. F. Reid, Editor of the "Agricultural Journal," on "Agricultural Journalism and its Assistance to the Man on the Land." This was followed by addresses on "Cane Diseases," by Mr. E. J. F. Wood, and on "Insects Affecting Sugar-cane," by Mr. R. W. Mungomery. Exhibits of cane diease and cane insects attracted considerable attention.

On the motion of Mr. T. Dexter, of the Bundaberg Cane Growers' Executive, a hearty vote of thanks was accorded to the speakers, to the Chemist in Charge of the Station (Mr. Pringle), and to Mrs. Pringle and the staff for the excellent laying out of the luncheon and the care taken of the comfort of those attending, also to the Director for the organisation of the field day.

During the afternoon a very fine demonstration of farm implements was made by the various machinery agents, which aroused the keenest interest. These included tractors, trash-burying ploughs, cane planters, rotary cultivators, disc ploughs, and fertiliser distributors.

A most interesting and instructive day was concluded about 5 o'clock, the weather being all that could be desired.

CANE PEST COMBAT AND CONTROL.

The Director of the Bureau of Sugar Experiment Stations, Mr. H. T. Easterby, has received the following report (2nd May, 1927) from the Entomologist (Mr. E. Jarvis) at Meringa, for the period March to April, 1927; dealing with various natural phases of cane-grub control affecting the early life-cycle stages of our grey-back cockchafer Lepidoderma albohirtum *Waterh.*

Some Phases of Natural Control Affecting Cane Beetles.

At a meeting of the Australian Sugar Producers' Association, held at Mossman towards the end of July in the year 1915, one of the questions brought up for discussion had reference to the apparent scarcity of grubs in certain districts from causes unknown. The writer, who was present at the time, stated that in some instances such immunity might reasonably be attributed to unsuitability of the soil, or the absence of food-plants of the beetles in the vicinity of plantations, or to the operation of adverse climatic influences.

During the past twelve years, however, sufficient data has been obtained to throw considerable light on this interesting question which seemingly still continues to puzzle many of our intelligent cane-growers.

The chief controlling influences affecting varying degrees of grub-infestation are:—

Firstly, those brought about by prolonged spells of dry weather which happen to occur during the months of October to January;

Secondly, the disposition, with relation to infested areas, of suitable food-plants or feeding-trees of the beetle.

Thirdly, the altitude of such infested cane land; and mechanical condition of the soil.

Effect on Beetles of Drought Conditions.

Undoubtedly, the first of these controlling agents is of paramount importance, since the operation of drought conditions during the period above-mentioned is responsible at times for a mortality of 95 per cent. or more of the beetles, which, owing to the hard, dry nature of the ground are unable to reach the surface.

Such mortality is likely to prove greatest on those areas where the trees and shrubs in the immediate neighbourhood of canefields have been cleared off, thus exposing practically the whole of the surface soil to the influence of the sun.

When a check of this nature is experienced over an extent of several square miles of country, growers can hardly fail to notice the almost total absence of grubs the following season; while in the event of such a set-back having chanced to occur in a locality free from patches of timber, &c., these beneficial effects may continue for several years. We may reasonably assume, therefore, that in exceptionally favourable localities such climatic control may occasionally result in the total eradication of this pest for the time being. Reinfestation of such a district at some future date, owing to further invasion by migrating cane-beetles is, of course, possible, but very unlikely to happen.

Effect on Beetles of Position of Feeding-Trees.

With regard to the second phase of control, the action of which depends upon the disposition of the feeding-trees of this insect growing close to cane land, growers would do well to notice that instances where invasion of a district by migrating beetles has led to ultimate establishment of this pest (such as happened at Highleigh during 1897 to 1907; Bulletin No. 17, pp. 90-91) the reason for continuance of such infestation may often be due to the position of food-plants near at hand chancing to offer facilities favourable to the aerial existence and early life-cycle stages of the beetle in question. Extensive belts or clumps of timber containing feeding-trees are undesirable, especially when lying about half a mile from the south-east border of canefields; but when happening to fringe the banks of a river or creek running through the midst of cane land such trees should always be cut down and destroyed. Belts of timber lying close to north-west headlands—especially when present along the bases of mountain ranges—often form favourable breeding-ground from which the female beetles when ready to oviposit fly across into the nearest canefield to lay their eggs.

In the event of wooded mountain slopes near at hand chancing, as sometimes happens, to form a cul-de-sac on three sides of a plantation, and to be open on the other to the south-east trade wind, the cane in such situations when growing on volcanic soil is almost certain to be badly grub-infested. In cases of this sort the food-plants nearest to the plantation should be searched for and destroyed. An effort ought also to be made to capture the beetles during the first two or three weeks immediately following their emergence from the ground, by means of suitable trap-trees, like *Ficus pilosa, Ficus nesophila, Eucalyptus tessalaris,* &c., which should be planted close to headlands forming the north-west boundary of such cane land (see "Queensland Agricultural Journal," Vol. xxvii., pp. 181-182; and "Australian Sugar Journal," vol. xviii., pp. 673-674).

Large isolated trees which may have been allowed to grow close to roadways running through canefields, or around farm buildings, should be cut down. Big "Tar Trees" (*Semacarpus australiensis*), or "Weeping Figs" (*Ficus benjamina*) will often attract great numbers of "grey-backs" and serve to induce them to linger in the neighbourhood of the cane.

Effect on Beetles of Topographical and Meteorological Conditions.

Touching briefly on the third phase of natural control, which, during the flighting season, appears at times to exercise an influence on these cockchafers throughout the period occupied in egg-laying, it is generally admitted by growers that the higher portions of cane land, such as the tops or ridges of hilly country of volcanic origin are usually more often grub-infested than low-lying areas or river flats. An interesting illustration of this point occurred at Daradgee last August on volcanic country, when it transpired that the grub damage experienced on thirteen different selections was confined in every case either to hill-tops or to slopes leading up to elevated ridges. The reason for such infestation may be explained very simply if we assume that egg-laden beetles when winging their way from the feeding-trees to some suitable spot in which to deposit eggs would be likely to come to rest on the first elevated portion of cane land chancing to obstruct their line of flight.

During migration, while flying over level country, these cockchafers appear to keep at a fairly uniform distance from the ground; all travelling in the same direction at about a height of from fifteen to twenty-five feet from the surface.

Doubtless, the female beetles, when heavy with eggs fit for exclusion, would be far more likely to settle when encountering obstruction from high ground than would be the case just after emergence from the soil prior to development of the ovary.

Again, the height at which they travel (a factor of importance in this connection) is probably influenced or determined by atmospheric conditions prevailing at the time. The occurrence, for instance, of several abnormally damp or wet nights during the period of egg-laying might perhaps induce female beetles to avoid the soil of low-lying ground and river flats as being unsuitable to healthy development of their eggs or young larvæ.

This may help to explain the reason why canegrowing on well-drained soils of a friable nature is so very liable to be attacked by cane-grubs. In support of the above supposition, I may mention that during very wet weather in March and April, grubs of this beetle usually come to the surface of even well-drained soils to escape the wet, and at such times, when removing dead leaves or other débris from between cane rows, may sometimes be seen lying actually on the top of the ground.

It has been suggested that friability of the soil may attract the beetles on account of its allowing greater freedom of movement for the grubs than is possible in clay-loams or other heavy land. It seems far more likely, however, that the attraction of friable soils lies in their better aeration, a condition which appears to be very congenial to larvæ of our grey-back cockchafer.

"THE BEST EVER."

A Chatsworth reader:—"I must congratulate you on such a fine 'Queensland Agricultural Journal' for May—the best ever."

FIELD REPORTS.

The Northern Field Assistant, Mr. A. P. Gibson, reports (11*th June*, 1927):—

CAIRNS.

Particulars of the past season's crop and that expected for 1927.

SEASON 1926.

Mill.	Tonnage.	Area Harvested.	Tons per Acre.
Babinda	195,129	9,325	20·9
Hambledon	193,116	9,295	20·8
Mulgrave	189,349	10,005	18·9
	577,594	28,625	

SEASON 1927.

Mill.	Estimated Tonnage.
Babinda	190,000
Hambledon	160,000
Mulgrave	155,000
	505,000

It will be seen that the 1927 crop at present is considerably below that of 1926. With favourable weather much of this leeway may be made up. About 82,000 tons sugar at 94 n.t. were manufactured in 1926; this amount is valued at some £2,000,000.

The Crop.

Under the Northern sun planters live to good purpose, for the soil and climate work with them. The district crop is composed of many varieties, many of which are arrowing. Generally speaking, the cane was backward and required rain to ensure continuous growth. The scanty rainfall of the latter half of last year, and the abnormal weather of February had an ill-effect on the seasonal crop. The lowlands adjacent to the Barron and Mulgrave especially suffered by flooding, and in consequence the cane had sprouted heavily.

Varieties.

Principal varieties grown:—N.G. 15 (Badila): Where this will grow there is none just as good. The continual growing of this most popular cane without change, coupled with careless plant selection and improper cultivation is slowly bringing degeneration, consequently it is becoming more susceptible to diseases. H.Q. 426 is giving satisfaction; it is an excellent ten to twelve months cane for well-drained medium-quality soils. It is outstanding in quality, but, unfortunately, is one rather subject to most diseases. H.Q. 485 is not a popular cane, as it is a shy stooler, therefore permitting continuous sunlight and heavy weed growth. B. 147, D. 1135, and 7 R. 428 really cannot be classified as good all-round canes in this district, yet are suitable for some of our drier and less fertile soils. The growing of Q. 813, Korpi, and E.K. 28 might be extended with profit to growers and manufacturers alike on selected soils.

Cultivation.

The planter's object at all times should be to win greater and superior crops from his land, with a minimum of costs, which will enable him to meet the ever-rising tide of competition; the prospects, of course, favour the man with the better land. We must get to know our soils and study more closely disease-free varieties of quality most suitable for them. Tractors are numerous and necessary to speed up our most important field work. Many fields, however, are badly designed for their economic use; the pulls are too short, much time and extra wear and tear are occasioned when turning.

Planting.

It should be understood that if diseased plants are used they will produce diseased canes; this operation should be surrounded with all necessary precautions. The planting period is fast approaching; in fact, some have planted, others are planting, and many are busy preparing for this important work. In view of this a few notes may prove helpful.

(1) Avoid hurry-up or improper cultivation. Better cultivation returns butter crops.

(2) Important.—Select suitable disease free, vigorously-growing cane of quality for seed, use a sharp knife for cutting, eliminate anything faulty; rooty end plants or immature or cabbage-tops should be discarded.

(3) The fertility of the soil, variety intending to plant and subsequent interspace cultivation generally determine the space between cane drills in Queensland; this varies from 4 to 5 feet. Heavy foliage and good stooling varieties require a greater interspace than do erect sparse-leaved ones. In ploughable land, seed may be placed almost continuously in drills some 2 to 3 inches of soil covering should be ample. This, however, is subject to seasonal conditions, and time of planting. Throwing whole canes in the drill, cutting up and covering them as they lie, is not plant selection.

(4) Endeavour to control weed growth in fields and headlands right from the start by timely cultivation.

Pests and Diseases.

Grubs have been responsible for a considerable amount of damage in isolated fields. Top Rot, Leaf Stripe, and Leaf Scald were present in the area. Top Rot was occasioning severe crop destruction in parts of Freshwater; this complaint appeared to be waning. This has occurred in our canefields more or less for many years past. In the year 1893 at Macknade, it is reported the entire crop of available cane then in view in the limited area of its occurrence was destroyed and thrown into the river. Year 1903, Henry Tryon made an inquiry into the nature and origin of this malady, and he considered it to be primarily and essentially a disease of the roots, and that the abnormal conditions under which the disease occurs are principally climate. Leaf Stripe had spread to other varieties and fields at Sawmill Pocket. Leaf Scald was found to be more prevalent in the Gap and Freshwater area. Gumming disease was not found at Aloomba this inspection.

MOSSMAN.

This most northerly sugar factory for years past has been in want of more cane; because of this and the district's isolation it has not progressed as others have done. Its cane area contains some inferior land which cannot be substituted for better, therefore its available ground is inadequate under most favourable conditions to provide cane enough to supply profitably the mill's seasonal requirements.

In Retrospect.

The following figures are interesting and show the upward progress of the mill since 1923:—

Particulars.	1923.	1924.	1925.	1926.
Number of Suppliers	120	125	146	153
Tons of Cane Crushed	75,544	83,460	80,276	84,579
Tons Sugar at 94 n.t.	10,320	9,495	10,503	11,130
Average c.c.s.	15·07	12·64	14 2	13·72
Co-efficient of work	90·65	90·0	92·14	95·91

The average cane tonnage per acre for the district was 14.1 compared with 14.6 of last year. The cane reached its peak of quality between the middle of September and the middle of October. Some 4,000 samples were tested. Appended is the average c.c.s. of the main varieties milled, together with the area under crop of each:—

Variety.	Area under Crop.	Percentage Area.	Percentage c.c.s.
H.Q. 426	1,579	26·4	14·65
N.G. 15 (Badila)	1,321	22·1	14·21
Q. 813	131	2·2	14·17
M.Q. 1	45	·7	13·89
D. 1135	1,635	27·5	12·95
M. 189 (Black Innis)	120	2·0	12·85
Green Goru N.G. 24 B	234	4·0	12·49
B. 147	557	9·3	12·37
Mixed Canes	348	5·8	..

It will be seen that H.Q. 426 is again leader in the field as far as quality is concerned.

Soils.

Generally shallow and cohesive; lime, more draining, better tilling, and the growing of leguminous crops is necessary to improve its physical texture.

Cultivation.

Cultivation had obviously improved; some plants yet appear fogged by old style methods. The better cane price of last year had given the farmer heart to do things and enabled some to purchase tractors. It is gratifying to note the farmers are grasping the immense importance of improved cultivation before and after planting, also better plant selection. The management is alive to this part of the business and is endeavouring to help raise the district's yield of cane and sugar. Improved returns can be achieved by reducing the area planted to D. 1135—a medium quality and hard-cutting cane—and in its place plant the following better varieties:—Q. 813, Korpi, Oramboo, J.E.K. 28, and Badila (where it will grow); H.Q. 285 also should do well in this area. For years past two H.Q. 426 sports have been noted on Bonnie Doon. So far as is known, such sports are rarely better than the parent cane. Excellent crops of Q. 813 and E.K. 28 were noted in poor to medium-quality land.

Planting.

A larger area than usual has been planted, which if given timely cultivation and a favourable season, should yield a greater crop for 1928. It is beneficial to plant immediately after the final ploughing where the soil is cohesive. Lining out with sticks and drilling with the swing type of plough wastes time and is ancient. More economic and superior work is performed by the drill plough with marker attached. Do not drill too far in advance of planting, as soil moisture is unnecessarily lost thereby.

The Crop.

Since the blow, the crop has taken advantage of the favourable weather, and in consequence appeared half a ton better per acre this year. It is forecasted that some 82,000 tons will be harvested (providing the weather holds good) from nearly 300 acres less to cut than in the year 1926.

Pests and Diseases.

Grubs were responsible for greater damage than usual. Wire worms had destroyed many primary shoots. So far, rats have caused little injury; as the season becomes drier the destruction is likely to increase. Leaf Stripe, Leaf Scald, and a little Mosaic was noted in H.Q. 426. The outstanding disease is, of course, Leaf Stripe; this has been in the area for many years past, and is very prevalent in B. 147, D. 1135, M.Q. 1, N.G. 24 B., Q. 855, and, to a lesser degree in N.G. 15

and H.Q. 426. In a small area of B. 147 it was difficult to find a disease-free stool. We can only recommend the following:—

(1) Better plant selection;
(2) Removing affected stools in less-infected areas;
(3) Plough out severely diseased fields;
(4) Use leguminous crops;
(5) Important.—See that none of the old stubble remains prior to planting;
(6) Plant up with a variety change.

Noxious Weed.

Guinea Grass, a pest known as Star of Bethlehem, is spreading too rapidly; this should be kept under control.

Railroad Extension.

The tramway to the Whyanbul Creek section is being extended nearly half a mile.

MAIZE STORAGE AND WEEVILS.

The question as to whether husked maize keeps free from weevils longer than unhusked grain has been raised again by some Southern farmers. This is what the New South Wales Department has to say about it:—

The early maize crop develops weevils so badly that every means of minimising the damage should be taken advantage of. Such maize is generally brought into the barn or shed and stored for a time until it is fit to shell. The question, however, arises as to whether it is best to harvest maize—early or late maize—in the husk or husk it from the standing stalks. The usual method on the North Coast (N.S.W.) is to pull the ears in the husk and store in the sheds until fit to shell or until required. On the larger farms contract or private husker-shellers are used, but on the smaller farms hand-husking is resorted to, followed by shelling with a small machine by the farmer himself.

On the South Coast (N.S.W.) and in the cooler tableland districts, where weevils are not very injurious or are altogether absent, and where the winters are colder and the maize takes longer to dry out, it is advisable or necessary that the ears should be husked before storing. On the average North Coast (N.S.W.) farm, maize in the ear, either husked or unhusked, cannot be successfully fumigated in the usual type of shed, and the question is: How does maize keep best—husked or unhusked? In the case of early maize, it is better on reasonably small areas to husk from the standing stalks, thus ridding the ears of a large number of weevils, and reducing the number carried into the storage sheds. It is best that this early maize should not be kept long.

Storing Late Maize.

Even late maize should not be kept too long in the cob; it is better shelled and stored as shelled grain. But where there are no facilities on the farm for storing as shelled grain, and where late maize has perforce to be kept on the cob, it will be found best on the North Coast (N.S.W.) to keep it in the husk. Such late maize is not greatly infested at harvest (in the winter), and if it were husked it would be at once exposed to weevil which had been breeding in the shed from the early crops. Unhusked, only those ears which are not well covered with husk are infested for the most part, and with a variety which has been well improved in respect to its husk covering, late maize stored in the husk will keep very well for some time.

It has been suggested that, in average varieties, it would be a good plan to separate at harvest the well-covered ears from those poorly covered with husk, and that the former could then be kept for a very long time, but this is not quite a practical suggestion. Moreover, detection of infested ears from the appearance of the husk in every case is scarcely possible, while earworms and rodents lessen the protective value of the husk covering in storage, so that apparently resistant ears may become infested.

Summing up, it appears that the North Coast (N.S.W.) farmer would be best advised to husk the early maize at harvesting if the area is not too large and if hand-husking is the usual practice on the farm, and to harvest and store the late crop in the husk. At present, for the most part, the whole of the maize crop is harvested and stored in the husk.

CANE-GROWING AND ITS PROBLEMS.

FIELD DAY AT BUNDABERG.

FARMERS GATHERING AT THE MARGAM EXPERIMENT STATION.

Between 500 and 600 farmers from all districts included in the Southern Sugar Belt assembled on Saturday, 28th May, at the Sugar Experiment Station at Margam, near Bundaberg, for the Annual Field Day. That the interest of all sections of the industry is being maintained in scientific agriculture was plainly evident by the enthusiasm and keen appetite for information displayed by the large gathering.

The beneficial effect of the bountiful rains of last summer was seen over a country-side of wonderful beauty. The arrangements at the Station for the entertainment of the visitors and their tour of inspection through the experimental plots were complete in every detail. Under the guidance of the Director of Sugar Experiment Stations, Mr. H. T. Easterby, assisted by the Station staff, they were piloted through the fields.

Much interest was manifested in the new canes undergoing furrow tests.

Power cultivation outfits were also seen in action, and their fine field performances followed with close attention.

At the luncheon interval several interesting addresses were delivered to a large and appreciative audience. Subjoined is an abridged report of the proceedings.

THE Annual Field Day at Bundaberg on 28th May was an unqualified success from every standpoint. Apart from their educational value, such gatherings have also a high social value, for they are really annual reunions at which farmers from different districts meet one another and discuss matters of mutual concern.

Included among the visitors were Messrs. H. T. Easterby (Director, Bureau of Sugar Experiment Stations), J. F. F. Reid (''Queensland Agricultural Journal''), E. J. Fergusson Wood and R. W. Mungomery (officers of the Bureau), F. M. Forde, M.P., W. A. Brand, M.L.A., W. G. Gibson, as well as farmers from Maryborough, North Coast, Mount Bauple, Goodwood, the Isis, Pialba, Gin Gin, Wallaville, Bucca, Avondale, and other centres.

At 11.30, the Director called the gathering together in front of the office at the Station, and in the course of a short address reviewed the work of the Station for the past twelve months.

Before proceeding with the main topic of his address, Mr. Easterby, who was given a rousing reception, said he desired to apologise for the unavoidable absence of the Acting Premier (Hon. W. Forgan Smith). The programme for the day was the same as in former years, a walk through the fields, followed by a light luncheon, several short addresses, and then a display with various implements.

He thought they would agree with him that the display of farm implements was the best ever presented at the Station. He desired specially to mention Messrs. Wypers Bros., as that firm had always provided an interesting display. On this occasion the firm had exceeded previous efforts. Messrs. Wyper Bros. were taking on the manufacture of farm implements on an extensive scale, and the service they were rendering to the industry could not be over-estimated. They had shown commendable enterprise, and it was certainly a great advantage to the industry to have such a firm taking an active interest on the mechanical side.

Fertilising Experiment.

The experiment with mixed manures containing a heavy dressing of potash was concluded last season, and the results were most interesting and conclusive, as they further confirm the necessity for potash on these soils. The yield of all these plots

PLATE I.—A STAND OF CANE AT THE SUGAR EXPERIMENT STATION AT MAREAM, NEAR BUNDABERG.
Fine Stools of Q.1098.

of second ratoons last year was poor, due to the severe drought, but the plot to which no manure had been applied only gave a yield of 1.34 tons of cane, having practically died out. The average results for these crops, plant, first, and second ratoons, were—

Plots 1 and 3 to which a mixture of 100 lb. of sulphate of ammonia, 100 lb. nitrate of soda, 200 lb. sulphate of potash, and 200 lb. meatworks had been applied, gave an average yield of 17 tons of cane per acre, while the plot to which no manure had been applied yielded 10.41 tons of cane per acre—the difference being 6½ tons of cane per acre in favour of the manure. Analyses of our red volcanic soils in Bundaberg and Childers show them to be very low in available potash, and many of them are low in total potash also. The application of potash in larger quantities in our mixed fertilisers could, therefore, be recommended on this type of soil.

Other Experiments.

Other experiments were laid down in connection with the use of potash, as under:—

Plot 1.—700 lb. mixed manure per acre, containing 100 lb. sulphate of ammonia, 500 lb. sulphate of potash, and 100 lb. meatworks manure.

Plot 2.—500 lb. sulphate of potash per acre.

Plot 3.—No manure.

Plot 4.—No manure.

Plot 5.—500 lb. sulphate of potash per acre.

Plot 6.—700 lb. mixed manure per acre, containing 100 lb. sulphate of ammonia, 500 lb. sulphate of potash, and 100 lb. meatworks manure.

The yields in the plant crop last year, due to the dry weather, were low, but this year, as they would see, the manures were going to give results. The results last year were slightly in favour of potash used alone.

Further trials with potash manures would be made commencing this year as follows:—

Division E3, Plot No. 1; variety, D. 1135; ordinary ploughing; cowpea planted; average weight of cane per acre, 14.90 tons; yield of c.c.s. per acre, 2.11.

E3, Plot 2, D. 1135; ploughed and subsoiled; cowpea planted; average, 17.97 tons; c.c.s., 2.59.

E3, Plot 3, D. 1135; ordinary ploughing, but fertilised with 100 lb. sulphate of potash, and 200 lb. meatworks manure applied broadcast previous to planting cowpea; average, 18.46 tons; c.c.s., 2.23.

E3, Plot 4, D. 1135; ordinary ploughing; cowpea planted; average, 15.64 tons; c.c.s., 2.21.

First Series.

Plot 1.—300 lb. sulphate of potash per acre.

Plot 2.—300 lb. muriate of potash per acre.

Plot 3.—500 lb. sulphate of potash per acre.

Plot 4.—500 lb. muriate of potash per acre.

Plot 5.—No manure.

Second Series.

Plot 1.—300 lb. sulphate of potash per acre.

Plot 2.—300 lb. muriate of potash per acre.

Plot 3.—500 lb. sulphate of potash per acre.

Plot 4.—500 lb. muriate of potash per acre.

Plot 5.—No manure.

It was desired to make further comparisons with sulphate and muriate of potash.

Further manurial experiments with first ratoons gave the following figures:—

Four plots to which a mixture containing 100 lb. of sulphate of ammonia, 150 lb. nitrate of soda, 150 lb. sulphate of potash, and 200 lb. meatworks per acre yielded 28.74 tons of cane per acre, and 4.16 tons of sugar per acre, while four plots without manure gave a yield of 12.41 tons of cane per acre, and 1.56 tons of sugar per acre. This gave an increase for the use of 600 lb. of mixed fertiliser of 16.33 tons of cane per acre and 2.60 tons of sugar per acre, a particularly fine result and a most payable one, the cost of the manure and its application being about £4 5s. per acre.

Photo.: W. J. Cunningham, Bundaberg.] PLATE 2. UNDER THE PINES. FIELD DAY AT BUNDABERG.

An inspection of Experimental Sugar-Cane Plots, followed by welcome refreshments. The enterprising lad in the left foreground is still "on the bottle" — lemonade in this case.

Experiment with Sulphate of Lime or Gypsum.

Previous reports had shown that no results had ever been achieved at the Bundaberg Sugar Experiment Station for the use of lime oxide or lime carbonate. A trial was now being given to lime sulphate. In the plant crop the results were negative, and this was repeated last season in the first ratoon crop, the plot with no sulphate of lime giving a slightly higher yield than the plots to which sulphate of lime was applied.

Experiments with Green Manure.

In the preparation of this land before planting cowpea, Plots 1 and 4 received ordinary ploughings only; Plot 2 was subsoiled in addition, and to Plot 3 100 lb. sulphate of potash and 200 lb. of meatworks manure were applied.

THROUGH THE FIELDS.

At the gates before entering the field a copy of the programme was handed to each farmer, thus enabling him to follow the various experiments as they were detailed by Mr. Easterby. The programme was as follows:—

Sugar Experiment Stations were established for the purpose of conducting experiments with sugar-cane, such experiments comprising cultivation, planting, manurial, and other investigations.

The experiments with canes, cultivation methods, and growth of varieties will form part of to-day's demonstration, and a list now follows for the general information of visitors.

The figures in brackets denote the commercial cane sugar or c.c.s. of the different canes; when c.c.s. figures are not given, no analysis has yet been made:—

Division C1.—Badila, second ratoons, nineteen months old—

Plot 1.—Mixed manure (17).

Plot 2.—No manure (17.0).

Manures applied in November, 1925, consisted of 150 lb. sulphate of ammonia, 100 lb. nitrate of soda, 150 lb. sulphate of potash, and 200 lb. meatworks fertiliser per acre.

Early in 1927, 100 lb. of sulphate of ammonia and 50 lb. nitrate of soda per acre were applied as a top dressing.

The yield of the first ratoon crop in 1925 was 30.11 tons from the manured plot and 15.54 tons from the unmanured crop, showing an increase of 14.57 tons per acre for the use of the mixed manure.

The difference in the growth of the experiments was most clearly marked, and Mr. Easterby remarked on the advantages resulting from scientific manuring.

Division C2.—Mauritius 1900 Seedling, first ratoon, eight months old. Revenue.

Division D.—Indian canes: Varieties, plant canes, twenty months old. Revenue—

D. 1135 (14.5), Q. 813 (16.0), Co. 227 (15.0), Co. 213 (14.0), Co. 210 (15.0), Yellow Caledonia (14.22), Assam Red (15.0).

Mr. Easterby said that a number of the canes included in the division had been introduced from India. The three Co. were rather thin, but they were being tested. Assam Red had proved a very good cropper in India, and was doing well here. Yellow Caledonia was very popular in Hawaii, and it also gave excellent promise in Queensland.

Divisions E1 and E2.—Q. 813, first ratoons, eight months old (16). Experiments with manures—

Plot 1.—Mixed manure, consisting of sulphate of ammonia 100 lb., sulphate of potash 500 lb., and meatworks 100 lb. per acre.

Plot 2.—Sulphate of potash only—500 lb. per acre.

Plot 3.—No manure.

Plot 4.—No manure.

Plot 5.—500 lb. sulphate of potash per acre only.

Plot 6.—Mixed manure, consisting of 100 lb. sulphate of ammonia, 500 lb. sulphate of potash, and 100 lb. meatworks fertiliser per acre.

Division E3.—D. 1135, second ratoons, nine months old (14.5), green manure experiments.

Photo. : W. J. Cunningham, Bundaberg.]

PLATE 3.—AFTER LUNCH ADDRESSES UNDER THE CHAIRMANSHIP OF MR. EASTERBY.

The Editor of the "Queensland Agricultural Journal" (Mr. Reid) on the rostrum. A section of the crowd numbering between 500 and 600 cane farmers. Many others are seated in the ring and at the rear.

The treatment of the plots before the growth of green manures was as follows:—

Plot 4.—Ordinary ploughing.

Plot 3.—Ploughed and subsoiled.

Plot 2.—Ordinary ploughing, and 100 lb. sulphate of potash and 200 lb. of meatworks fertiliser applied per acre.

Plot 1.—Ordinary ploughing.

Division B6.—Badila standover, first ratoons, twenty-two months old.

In 1925 these plots gave the following results as a two-year-old crop—namely, 41.66 tons of cane and 6.44 tons of commercial cane sugar per acre.

The manure applied was a mixed fertiliser at the rate of 150 lb. of sulphate of ammonia, 150 lb. sulphate of potash, 150 lb. meatworks fertiliser per acre, with a top dressing of 200 lb. nitrate of soda per acre the second year.

This shows what could be done by growing Badila as a two-year crop, seeing that the costs of cutting and cultivation of one crop are saved. The use of fertiliser, however, is unnecessary.

Division B5.—New cultivation experiment.

Division B4.—Competition trials with sulphate and muriate of potash.

Division B3.—Q. 813, first ratoons, eight months old (16), manurial experiments.

Plot 1.—No manure.

Plot 2.—Mixed manures, as follows:—Sulphate of ammonia, 150 lb. per acre; sulphate of potash, 200 lb. per acre; meatworks fertiliser, 250 lb. per acre.

Plot 3.—Same as plot 2.

Plot 4.—No manure.

Plot 5.—Same as plot 2.

Plot 6—Same as plot 2.

Division B2.—D. 1135, second ratoons, nine months old (14.5), experiments with calcium sulphate or gypsum.

Plot 3.—No sulphate or lime per acre.

Plot 2.—Two tons of sulphate of lime per acre.

Plot 1.—One ton of sulphate of lime per acre.

The average yield of these plots for the plant and first ratoon crops was as follows:—

Plot 3 (no lime), 20.28 tons per acre.

Plot 2 (2 tons sulphate of lime), 19.33 tons per acre.

Plot 1 (1 ton of sulphate of lime), 18.52 tons per acre.

These experiments tend to show that even where the form of lime is changed from carbonate to sulphate, lime still refuses to give any benefit on the Woongarra red soils.

Garden.

E.K. 28 plant cane, twenty months old (15.0).

E.K. Madoe plant cane, twenty months old.

D.I. 52 plant cane, twenty months old (14.27).

Q. 1098 plant cane, seventeen months old (15.0).

H. 227 plant cane, seventeen months old (14.7).

E.K. 28 plant cane, seventeen months old (15.0).

M. 28/10 plant cane, seventeen months old.

M. 35.11 plant cane, seventeen months old.

The Sugar Experiment Station will be pleased to welcome visits from cane-growers at all times, and to give them full information and advice as to varieties of cane and cultivation. Farmers are requested to make the utmost use of the station, in submitting problems as to soils, cultivation, fertilisers, &c.

On their return from their walk through the fields all present were entertained at a delightful al fresco luncheon arranged by the officer in charge of the Station (Mr. J. Pringle) and Mrs. Pringle, who were assisted by a number of ladies. Tables were set out on the lawns and refreshments were served.

THE ADDRESSES.

AGRICULTURAL JOURNALISM.

With the luncheon over, the farmers were called together by Mr. Easterby, and from a seat on the lawn several interesting and instructive addresses were delivered.

Mr. Easterby briefly outlined the course these would take, and then called on Mr. Reid, the Editor of the "Queensland Agricultural Journal," for a speech.

Mr. Reid, who was very cordially received, said he was indeed pleased to have the opportunity of addressing such a large gathering of farmers. He desired to congratulate the sugar industry on its remarkably efficient organisation, of which they had that day abundant proof. In preceding years he had attended field days at South Johnstone and Mackay, at which were large gatherings of farmers, but this year's gathering at Bundaberg eclipsed the others in point of attendance. He congratulated the Queensland sugar-growers on being the first section of the agricultural industries to endow a scholarship at the University. It showed that the farmers were anxious to further the scientific side of their calling.

Journalism and the Farmer.

It was with real pleasure that he had accepted Mr. Easterby's invitation to say something to farmers in a general sort of way about journalism, particularly agricultural journalism.

Journalism was the most truly democratic of all callings, yet in the history of mankind newspapers had been stronger and more powerful than armies. Napoleon, they were told, feared four hostile newspapers more than an enemy battalion, and immediately placed them under an extremely rigid censorship.

Mussolini, his modern imitator, had evidently the same healthy fear of a hostile Press, so they found him suppressing the newspapers within his realm that had the temerity to detract from the virtues of the Italian dictatorship.

If anyone felt inclined to question the influence of the Press, they had only to remember the newspaper censorship during the war. If they had never before realised the subtle power of journalism, they realised it then. Living under rigorous censorship of the only news that mattered to them then, the absence of complete news of the plain facts caused grave anxiety morning after morning, and they soon learned how very easy it was to give credence to every rumour of bad news, or worse news of national disaster.

"The truth is," to use the words of Arthur Mee, the well known English writer, "that without the journalist, life as we know it would be impossible. He stands between light and darkness, between social peace and civil war, between democracy and despotism, between the freedom of the twentieth century and the thraldom of the less enlightened ages. He is the guardian of the liberties of the human race."

The Reflector of Human Life.

Since journalism then was the reflector of human life, nothing in human life could happen that was outside its range. As memory, whether they liked it or not, engraved upon itself the everlasting remembrance of everything they saw, or heard, or did, or knew, so journalism brought, as Mee further remarked, all life, all activities, all thought, all labour, into its boundless field. Nothing was too trifling for its interest; nothing could be too important for its debate.

To go further, and become exact: As the mind edited the memory, calling up at will those things which interested it, whether facts, or scenes, or men, or things, whether they had treasured them for a day or half a lifetime, so the mind of the journalist edited the happenings of every day and every hour, appreciated this, questioned that, threw the other into the basket, and presented his story to the waiting world with a judgment born of an intimate relation with men and matters and a sound knowledge of the relative value of things.

The whole world was alive to the journalist who knew his work and was in earnest, and to whom the first of all considerations, to himself, was his own sincerity.

Whatever one might think of the Press, however—and to many of them its reputed power might, mistakenly he thought, seem largely an illusion—it could not be denied that the newspaper or journal contained much in the way of romantic interest to most of them.

Like the farmer, the editor was never stuck for advice or advisers. Just as every second train traveller—if he had never swung more than ten yards off a blotting pad, or had never by any chance swung between a pair of plough handles, he is all the more emphatic—just as every second traveller was ready and willing to advise the farmer how to farm, so almost any man felt that he could give points to any editor in running what was sometimes called euphoniously a "rag."

The history of the Press was a record of initiative and perseverance, and the triumph of pluck in face of tremendous difficulties—and it disposed effectually with the popular belief that any fool could run a newspaper. That was, however, by the way, and their main purpose was to take a rapid survey of what journalism meant to the farmer, and to what extent it was an aid in solving the rural problems of to-day, which, as they all knew, were problems of straightout construction or reconstruction.

The First Agricultural Journal.

The needs and advantages and virtues of country life were themes that had run through literature for over 2,000 years, and, possibly, even further back than that. In the first century before Christ they found a cheerful Roman, Terentius Varro, issuing what was probably the first agricultural journal—"De Re Rustica," or "Rural Life," wherein, contributing to the age-old argument as to which was better, town or country life, he said, "Divine nature gave us the country, man's art built the city." In these days, however, they recognised the value of each of these factors in the general scheme of things, and in Queensland particularly they were realising the inter-dependence of primary and what was called secondary industry.

Each depended upon the other, and it was upon the balanced development of both that real national greatness was achieved.

Most people, however little they knew of journalism, knew the difference between a bright and dull publication. In the dull journal there was no change. It remained to-day what it was yesterday; it would be to-morrow what it was to-day. The next issue would look exactly like the last. It never disappointed, because it gave them nothing new to expect. It never surprised them, because they knew exactly what it was going to tell them.

The bright journal, on the other hand, looked as though it were alive—a throbbing, pulsating thing. As they opened it, they felt that they lived in a world very much awake, a world that was athrob with vital human interests, a world full of realities, with room, too, for the dreamer, who so often was the father of those realities.

Knowledge Versus Ignorance.

Agricultural journalism, continued Mr. Reid, was mainly educational. Education was the one thing for which no nation ever paid too much. Knowledge might cost a lot, but ignorance cost more. Ignorance was the greatest cause of waste. Ideas governed the world. In scriptural phase, "Where there is no vision the people perished."

The highest aim of education was to create new and strengthen old and tested ideals, blaze new trails of thought, and open new channels of effort and new furrows of industry. In furthering that aim, agricultural journalism was a sound and extending influence.

Production with Skill and Distribution with Wisdom.

In Australia to-day they, as an intelligent people, had accepted the fact that to build bigger and better a nation must produce with skill and distribute with wisdom. That fact, he thought, they all regarded as a leading factor in agricultural economy—a fact that was being hammered home by their agricultural Press.

Tribute to the Queensland Press.

Mr. Reid paid a high tribute to the Press of the State. Queensland, he said, was very fortunate in having a country Press of a very high standard. In the northern, central, and southern divisions of the State, journals devoted almost entirely to the interests of country people gave good service to the agricultural industry. In no capital in Australia was so much space allotted to rural affairs by metropolitan dailies as in Brisbane, while, from a farmer's point of view, the service given to his industry by his own local district papers could not be estimated too easily.

Results of experiments and notes on current agricultural topics and problems found with them ready acceptance and publication in full with wise and understanding comment.

Then there were the sectional periodicals, published monthly as a rule, that keep the farmer well informed of matters within the range of his more immediate industrial interests.

This active and valuable form of agricultural extension work, ably supplied and willingly given, merited all their appreciation.

Then there were the official publications of the Department of Agriculture and Stock, the chief of which was "The Queensland Agricultural Journal."

That journal could scarcely be described as one of light agricultural literature, but as a journal of record, research, and general information it performed some really useful public service.

The Job of the Agricultural Journalist.

Concluding, Mr. Reid said that while their scientists and field officers were able to get at the facts of any particular problem, whether of the laboratory or the field, the journalist had to get the ear of the farmer and impress him, if he could, with the economical importance of the scientists' and fieldmen's discoveries and investigations.

In healthy and progressive agricultural development, experimental work, they all knew, was essential, but if its results were not conveyed to the farmer, who, himself was often an original investigator, in a readable, digestible, and readily accessible form it was of little real service to the community. That was the job of the agricultural journalist. The value and importance of that work was quite obvious to every thinking farmer, and the farmer in alliance with the scientist, the engineer, the trained organiser of modern marketing, and the journalist might be depended upon, he thought, to see that their great rural advantages and opportunities in Queensland would not be neglected nor denied.

And the farmers of Queensland, no doubt, already appreciated fully the part of journalism, serving agriculture as comprehensively and efficiently as it served every other industry, was performing, and would continue to play in placing and sustaining agriculture in Queensland on a solid and lasting foundation, on which the prosperity of the State, ever extending, was based. (Applause.)

CANE DISEASES AND PESTS.

Mr. Easterby, in introducing Mr. E. J. Ferguson Wood, of the scientific staff of the Bureau, said that Mosaic had caused considerable damage in America. The two young men who were in America had been making investiagtions, and had sent out two cures which were at present being tried out. They were claimed to be disease resisters, and if they proved satisfactory they would be made available to farmers.

At the present time it was considered not advisable to distribute plants from the Bundaberg station. However, it was not the intention of the Bureau that any hardship should be levelled on the farmers as a result, so that if plants were needed these would be made available from the Mackay station.

Mr. Wood, in the course of an informative address, said that he intended to discuss briefly the cane diseases which were of greatest importance to them in the Bundaberg and Isis districts, and he had provided samples of the various diseases for them to examine carefully so that they would be able to recognise them in the field. He proposed to just give an outline of the symptoms, method of spreading, and control. For the sake of convenience they would divide the diseases into major and minor diseases. Major diseases included for their purpose Mosaic, gum, leat stripe, and Fiji disease. Minor comprise iliau, root rot, and other root troubles, and "X" disease in Childers.

Mosaic could be detected by the irregularly striped leaves, with which most of them were familiar. The patches of light and dark green appeared even in the youngest leaves, which fact served to distinguish Mosaic from the leaf-insect bites which farmers so often mistake for the disease. Often, especially in D. 1135 and M. 1900 S., less in Q. 813 and Black Innes, the stem is also striped, and may be shrunken and ribbed and even cankered.

Two Types of Infection.

There were two types of infection—primary and secondary. Primary was by infected cuttings; secondary by insect transmission. For this latter they blamed the corn aphis and the cane leaf-hopper which they might see on almost any cane stalk. Often they would see one infected stick in a stool of cane. This was an undoubted case of secondary infection, but the whole stool should be regarded as infected for planting purposes. Their control was based on those facts and on the fact that resistant varieties occur such as Q. 813.

The measures, recommended were, firstly, never to plant a diseased set, or even a stick from an infected stool, though that stick might not be showing the disease.

Photo.: W. J Cunningham, Bundaberg.]

PLATE 4.—POWER FARMING—A DEMONSTRATION AT THE BUNDABERG FIELD DAY.

Always choose the least infected field for plants, or if necessary get them from another farm. In the badly-infected areas near the river let them get rid of the wild sorghum and other grasses growing in the fields and on the headlands, for these were a source of infection, and to get plants from other clean areas. If they had gullies full of wild sorghum it might pay to plant Uba cane to get rid of the grass and use it for cow feed. Uba was immune to Mosaic and would grow rank in the gullies.

Corn and Cane.

In all cases corn should not be grown near cane, as Mosaic was undoubtedly spread in that way. It was not done up North, and the areas were almost free of Mosaic. Controlling bad cases of Mosaic is a slow process and they must expect the improvement to be gradual. Continued and strict seed selection is the only method, and it would pay. Remember they could easily lose 10 tons per acre on a 30-ton crop through Mosaic, and not notice the loss if they did not realise what a healthy crop would look like. Mosaic was one of their worst troubles. When the disease was less than 5 per cent. present it paid to dig out every infected stool. Just dig it out and let it die. Some farmers in Mackay had completely rid themselves of Mosaic. He advised them not to grow Shajahanpur 10, and be careful of Black Innes. Q. 813 was highly resistant, though when it did get Mosaic it was very conspicuous.

Gumming Disease.

Any farmer on the Woongarra should know the symptoms of gum. The yellow streaks with red dots and dead patches would be shown to them—they could see them in the Badila on the Station—and the depth of the sticks which ooze a yellow gum from the cut ends was also well known. Gum would only be controlled by selection of healthy seed from clean fields, drainage, and the use of resistant varieties. Q. 813 was the best of these and possessed many good qualities—high c.c.s., good yield on the right soil, and high resistance to other diseases. From the pathologist's point of view it was the best resister they had, while farmers who were growing it extensively found it a splendid cane. It was a shallow rooter, however, and on sandy soils or in grub country Q. 855 should be tried.

Gum, however, was not usually prevalent on sandy country. Badila, N.G. 16, D. 1135, M. 1900 S., and H.Q. 285 were susceptible. The disease had the habit of appearing suddenly, causing heavy losses, and then disappearing again, so that farmers were inclined to regard it as a necessary evil. He suggested the replacing of the worst infected portions of fields by Q. 813, and then, by seed selection or, better still, by the importation of clean plants, the gradual clearance of the farm. They could plant Q. 813 and then replace it by another variety, putting Q. 813 in the next block, and so on. Leaf Stripe occurred slightly in a few areas. The symptoms were—

(1) The elongation of the stick.

(2) The light green or pale yellow stripes in the leaves which at first glance resembled Mosaic, but which were regular and not on the leaves of the spindle. Moreover, the striped areas later died and the leaf became shredded. At the back of the leaf was a white down which was the fruiting portion of the fungus, the spores of which were wind-borne. The disease could spread rapidly, so digging out of infected stools was essential. They should be burnt.

Fiji Disease.

Fiji disease was not yet in Bundaberg, but since he had gathered evidence which pointed to the fact that it can travel about 30 miles from the source of infection, it was as well they should know it. The symptoms were a dwarfing of the stool, dark green, short, and deformed leaves with lumps or galls on the backs thereof. These galls were light green or brownish in colour, and run along the leaf, being anything up to 1½ inches long. They were the first symptom of the disease, and might be seen on canes otherwise apparently healthy. There was a long incubation period, so this disease was impossible to detect in the early stages. He had brought specimens of the disease from Maryborough under strictly observed precautions, so that they could see what it looked like. Let them get rid of the diseased plants, use clean seed, and try Q. 813 as a resistant variety.

Iliau, peg leg or foot rot, leaf sheath fungus, and "X" disease were all regarded as soil troubles. The soil in the Childers district was very low in potash and phosphate, and was in many cases very low in humus and deficient in lime. The

Photo.: W. J. Cunningham, Bundaberg.]

PLATE 5.—FARMERS' FIELD DAY AT THE SUGAR EXPERIMENT STATION, MARGAM, NEAR BUNDABERG, 28TH MAY, 1927.

A General View of the Gathering in the Power Farming Demonstration Area.

application of these with a good crop of giant cowpeas as often as possible would tend to diminish the loss due to these troubles. Soil was a big factor in cane-growing, and the neglect of it rendered them liable to diseases and diminished yield.

In Bundaberg the condition was not so acute, but potash phosphate and green manure were required. Iliau attacked the young cane, and bound the leaf sheaths with a dark fungus. Black fruiting bodies often appeared on the outside of the leaf sheaths. The growing tip would often twist on itself several times, and force its way out through the sheaths, often damaging itself, and dying in the process. Foot rot was also caused by a fungus, and affected M. 1900 S. and D. 1135 most of all. The cane fell over and lodged. Leaf sheath fungus bound the leaf sheaths of older cane, and often caused death.

Cane-Killing Weed.

Cane-killing weed had been seen around Bundaberg. It was a small weed with a purple flower, and was a parasite on the cane roots. Digging out was the remedy. In conclusion, Mr. Wood said that the golden rule of successful cane-growing was to plant their most healthy and best plants. This kept the cane from running out and was the best method of preventing disease. He advised them also to look to their soil. Impoverished soil meant weak growth, and a weak plant, as a weak animal, was the most favourable for a parasite to attack. If a man were run down he got diseases very quickly, and so did plants. The costs of cultivation were so high that it was imperative that the farmers and the Experiment Stations should pull together especially over diseases, and much could be accomplished. Every man could do his share and by degrees they should get complete control over all diseases as they had in Hawaii and other places. (Applause.)

CANE GRUBS.

Mr. W. R. Mungomery then addressed the gathering on entomological matters. He said that through one kind of grub appearing more or less always in the same district, sometimes to the total exclusion of the others, farmers occasionally expressed the opinion that there was only one cane grub, but at the outset he would like to dispel this common mistake, and have them understand that there were indeed several different species of very bad grubs, and each had its own peculiarities. He stressed the importance of differentiating between the various species of grubs commonly found in canefields, and justified the work of the entomologist, whose work in fighting those pests might appear to them somewhat vague and at times of no great importance, until they received a satisfactory explanation of the great issues involved, and they were then able to appreciate the reason for carrying out such work.

Sketching the history of the insect he said cane grubs, or "white grubs," as they are more widely termed, are the larvæ or immature form of a family of beetles called the Scarabæidæ. All were familiar with these beetles, most of which emerge after a rainy period about Christmas time. These beetles, like most other insects, lay eggs, and these eggs, on hatching, produced tiny grubs. The grub period is the longest, and it is then that the damage occurs, the destructive period continuing until the grub is full-fed, and eventually turns into the pupa, and later into the beetle stage.

During their life as a grub, they are located in the ground, generally far from right near the surface to as deep as about 15 inches (sometimes deeper, but usually between these limits), and, feeding as they do on organic matter, they eat rather indiscriminately from the roots of most kinds of grasses and other herbage, whilst others again live on the decaying vegetable matter, or humus, which is always present in the soil. In all cases, they pass enormous quantities of soil through their bodies while feeding. So, on the one hand, we get the kind of grub which eats sets, young roots, and the underground portion of the cane plant, and in time they weaken or kill it. To this class belong the greyback grub, in North Queensland, and the *Trichosterna* and *Furfuracea* grubs in our districts, the *Frenchi* grub being found right along the coastal sugar belt of Queensland.

On the other hand, one frequently met with other species of white grubs in compost heaps, in places where stale chop-chop has been dumped, and also in manure heaps. Some of these grubs are very large, and growers often have the idea that they are the ordinary cane grub, particularly well fed, and living under ideal conditions. Such an assumption is erroneous, for they are totally different, and belong to other genera, including such species as the well-known black elephant beetle and the smaller reddish-brown Isodon beetle. Both of these grubs occur regularly in such situations, and sometimes the canefields where these manures have been dumped, but they do very little damage (if any at all) to cane, and they cannot be included in the list of serious cane pests for that reason.

Coming back to the family of beetles like the greyback and Frenchi of Melonthidæ, as they are technically called, we get beetles and grubs which are closely related, and all of which have very similar feeding habits, but their relative size is of great importance, for whereas the greybacks do a great amount of damage owing to their great size and the rapidity of their growth, other species, such as Frenchella, being small and scarce, do practically no injury to cane, although they are found in canefields.

From the great differences in the sizes of beetles and their corresponding grubs, it would be clearly understood that for the layman it becomes exceedingly difficult for him to distinguish between the large or old grubs of a small species and the small or young grubs of a large species.

Rather fortunately for us each grub has some little distinguishing characteristic, which we are able to pick out. Sometimes this is in the shape of the jaws or mandibles, or sometimes in their feelers, or antennæ, but more often we have to rely on the shape or arrangement of certain hairs with which the body of the grub is covered, and by these means the entomologist is able to identify the grub.

Further, by carefully studying their habits, he is soon able to tell whether the grubs are root feeders, or whether they live on decaying vegetable matter, and so he is able to convey to the farmer the results of his experience, and tell him whether any of the grubs on his farm are likely to prove troublesome, or whether he need no longer worry about them. Also, he is able to state from his knowledge of the life cycle of the species in question whether at that particular time grubs are likely to occasion further damage, or whether they are full-fed and ready to go down deeper into the soil and pupate, and then their period of destructiveness would be at an end.

Knowledge Necessary.

Thus, continued Mr. Mungomery, one sees why it is most essential to know the various grubs that are present in a district, for without a perfect knowledge of their habits, one has merely to chance whether they will become destructive or not, and this is very unscientific. Moreover, it does not follow that because a farm has been free from grub attack for a great number of years it will always remain immune from their attacks. An instance of this occurred this year in the Bundaberg district, when one farmer suffered his first experience with grubs, after being on the same farm for twelve years.

On the table in the grounds a collection of insects was displayed, which comprised preserved specimens of grubs and other sugar-cane pests, as well as specimens of other closely allied insects which were likely to prove of interest. These he asked growers to inspect, and become familiar with them. In conclusion, he urged farmers to make use of the Entomological Laboratory. (Applause.)

Mr. T. Dexter moved a hearty vote of thanks to Mr. and Mrs. Pringle, Mr. H. T. Easterby, and the other speakers for the arrangements made for the day and also for the speeches, and this was carried by hearty acclamation. Mr. Easterby acknowledged the compliments paid.

An exhibit which commanded considerable attention was that provided by the Bureau offices, showing the different cane beetles, grubs, and other pests which did damage to the crops. The parasites which preyed upon these insects were also displayed in the collection. The exhibit also included samples of diseased cane, and altogether it was instructive, and was duly appreciated by the farmers.

A power farming demonstration, and also an effective display of the features and field work of modern farming implements, concluded a very successful day.

WOULD NOT BE WITHOUT THE JOURNAL.

A Kandanga subscriber renewing his subscription writes (26*th May*, 1927): *"Thanking you for the Journal in the past. I would not be without it." Writing from Warra* (30*th May*, 1927), *another says: "We much appreciate the help you are giving to men on the land."*

SPOTTED WILT OF TOMATOES.

By J. H. SIMMONDS, M.Sc., Plant Pathologist.

During last season a disease previously unrecorded from this State came under notice as causing considerable loss to tomato growers in some localities. This disease first appeared in Victoria, in the 1915-1916 season, and was later fully described by C. C. Brittlebank, who named it "Spotted Wilt" on account of its characteristic symptoms. It has now been reported from all the Australian States. In Queensland the disease has so far been definitely noted only in certain tomato-growing districts in the vicinity of Brisbane, but it probably also occurs at Maryborough. The amount of loss sustained varied on different farms from an odd plant to 50 per cent. of the crop.

Description of Characteristic Symptoms.

Affected plants can often be picked out on account of their tendency to produce an attenuated new growth—the young leaves of one or more branches remaining narrower than normal, and at the same time becoming curled around the mid rib, giving the branch somewhat of a drooping appearance. These symptoms, however, may be induced by certain other diseases, and the characteristic symptom of Spotted Wilt is the appearance on the leaves of numerous small brown spots, which produce in the early stages a distinct mottled pattern. These spots are more or less circular in shape and vary in size from minute dots up to about one-eighth inch in diameter. They are variously scattered on the upper and sometimes the lower surface of the leaf between the main veins (see Plate). The younger leaves situated towards the outer ends of the branches are usually the first to show this marking. The spots if numerous may coalesce, and the surrounding tissue then gradually turns yellow and dries out so that the leaf presents a withered appearance. Dark-brown surface streaks usually linear or broadly linear may occur on the leaf stalks and stems. On scraping, this discoloration will be seen to be restricted to the surface layer of cells only. In some cases the fruit may show brown to blackish greasy-looking markings of varying extent which do not usually penetrate the flesh for any great distance. The symptoms may appear on from one to all the branches. In the latter case the plant will finally present the appearance of complete wilt—a condition which is sometimes assumed very rapidly. Very vigorously-growing plants are perhaps the most affected.

Spotted Wilt in its later stages, when the leaves are all dead and drying, may be distinguished from the common Fusarium Wilt by the absence of the brown fungus-invaded patches of large-celled conducting tissue, which are seen in the case of the latter when the lower portion of the main stem is cut across.

Cause of the Disease.

Repeated attempts have been made by workers in the Southern States to find a fungus or bacterial parasite which might be the cause of Spotted Wilt, but without success. In the absence of a definite parasite of this nature the disease differs from most common tomato troubles. Spotted Wilt is probably similar to an American tomato disease known as "Streak," which has been shown lately by T. C. Vanterpool to belong to the virus type of disease. In this type are grouped a number of diseases presenting certain points of similarity.

Plate 6.—Leaflets from a Tomato Plant Affected with Spotted Wilt.
From a water-colour drawing by I. W. Helmsing, of the staff of the Chief Entomologist.

but whose causal agents are so minute that there has so far been developed no means of viewing them with certainty. What little is known about these organisms has therefore to be inferred from the reactions obtained in various experiments with the plant juice in which they have been shown to occur. It is probable that in the case of Spotted Wilt certain sucking insects which feed on the tomato are able to spread the disease by transferring juice containing the causal agent or virus from an infected to a healthy plant.

Control.

No certain means of control has yet been demonstrated. Spraying with a fungicide is of no avail on account of the nature of the disease. As an affected plant may harbour the virus with which healthy plants can be inoculated, such sources of infection should be kept to a minimum. The following recommendations are designed to reduce the loss due to this wilt:—

1. Pull up and burn any diseased plant as soon as it appears. A regular inspection of the plot should be undertaken at frequent intervals for this purpose. It is not sufficient to remove a single branch because this is the only one bearing symptoms, since the rest of the plant may be harbouring the infectious agent even though not showing signs of disease. Unfortunately, under certain conditions the plant may be a bearer of the virus without displaying the usual symptoms. This, however, should not be used as an argument for neglecting systematic destruction.

2. Spray with a contact insecticide for the control of sucking insects which may be agents in the dissemination of the disease.

3. Avoid excessive use of strong nitrogenous manures which tend to make the plant more susceptible by producing excessively vigorous succulent growth.

4. Clean up and burn the remains of the crop as soon as it has ceased to be profitable, as an odd infected plant left over from crop to crop may be the means of perpetuating the disease. This precaution will also help to control the various fungus diseases of the tomato.

A BUNDABERG FARMER APPRECIATES THE JOURNAL.

A Yandaran subscriber: "Although but a comparatively recent subscriber and reader of the 'Queensland Agricultural Journal,' I am a most enthusiastic supporter of it.

"When anything with which the Department is connected goes amiss there is enough noise to hearten a Chinese army for battle, but when things are O.K. no one thinks it worth while to utter a word of commendation. Honour to whom honour is due! The Journal is a very distinct credit to the Department and its officers, and, if paid for on the basis of valuable information gleaned therefrom, would be beyond the financial means of most of us to purchase. Wishing you and the Journal continued and well-merited success."

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF MAY IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALL DURING MAY, 1927 AND 1926, FOR COMPARISON.

Divisions and Stations.	Average Rainfall.		Total Rainfall.	
	May.	No. of Years' Records.	May, 1927.	May, 1926.
North Coast.				
	In.		In.	In.
Atherton	1·98	26	0·81	0·51
Cairns	4·49	45	1·10	1·47
Cardwell	3·57	53	0·26	0·29
Cooktown	3·03	51	0·45	0·73
Herberton	1·64	40	0·58	0
Ingham	3·42	35	1·58	0·25
Innisfail	12·34	46	9·82	1·08
Mossman	3·69	14	1·12	0·11
Townsville	1·33	56	0·03	0
Central Coast.				
Ayr	1·13	40	0	0
Bowen	1·30	56	0·11	0·08
Charters Towers ...	0·78	45	0	0·18
Mackay	3·81	56	0·59	0·57
Proserpine	4·63	24	0·48	0
St. Lawrence ...	1·80	56	0·08	0·38
South Coast.				
Biggenden	1·82	28	0·13	1·20
Bundaberg	2·76	44	0·18	9·95
Brisbane	2·81	76	0·02	1·27
Caboolture	2·92	40	0	3·05
Childers	2·25	32	0·10	4·58
Crohamhurst ...	....	35	...	5·37
Esk	2·03	40	0·02	0·80
Gayndah	1·57	56	0	3·93
Gympie	2·96	57	0·16	2·57
Kilkivan	1·89	48	0·11	1·29
Maryborough ...	3·18	55	0·12	9·64
South Coast—continued:				
Nambour	5·02	31	0·06	5·89
Nanango	1·55	45	0	0.34
Rockhampton ...	1·50	40	0·09	1·42
Woodford ...	2·95	40	0	1·65
Darling Downs.				
Dalby	1·34	57	0	1·18
Emu Vale ...	1·17	31	0	0·65
Jimbour	1·23	39	0	0·88
Miles	1·55	42	0	3·61
Stanthorpe ...	1·91	54	0·14	0·85
Toowoomba ...	2·22	55	0·08	1·43
Warwick	1·57	62	0	1·01
Maranoa.				
Roma	1·48	53	0·06	4·59
State Farms, &c.				
Bungeworgorai ...	0·59	12	0·04	4·45
Gatton College ...	1·70	27	0·03	0·44
Gindie	0·99	27	0	0
Hermitage ...	1·26	20	0	0·86
Kairi	1·99	12	*	0·03
Sugar Experiment Station, Mackay	3·44	29	1·13	0·53
Warren	0·95	12	0	1·12

* Return not received.

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for May, this year, and for the same period of 1926, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND,
Divisional Meteorologist.

Readers are reminded that a cross in the prescribed square on the first page of this "Journal" is an indication that their Subscription —one shilling—for the current year is now due. The "Journal" is free to farmers and the shilling is merely to cover the cost of postage for twelve months. If your copy is marked with a cross please renew your registration now. Fill in the order form on another page of this issue and mail it immediately, with postage stamps or postal note for one shilling, to the Under Secretary, Department of Agriculture and Stock, Brisbane.

PLATE 7.—MINISTERS OF AGRICULTURE IN CONFERENCE.
Delegates to the Conference of Ministers of Agriculture at Adelaide,
(For Key to Group, see page 33.)

AGRICULTURAL PROBLEMS.

INTERSTATE CONFERENCE AT ADELAIDE.

INTENSIVE SETTLEMENT AND WHITE AUSTRALIA.

The Annual Interstate Conference of Ministers of Agriculture and their officers was opened by His Excellency the Governor of South Australia (Sir Tom Bridges), at Adelaide, on Monday, 23rd May, and was continued on following days. All States were represented, and the South Australian Minister (Hon. J. Cowan) presided. It was stressed that wrapped up in the development of agriculture was the White Australia policy, and the liquidation of Australia's national debt. Subjoined is an abridged report of the proceedings, which will be read with interest by Queensland farmers.

Delegates to the conference were:—New South Wales—Minister for Agriculture (Hon. W. F. Dunn), Under Secretary for Agriculture (Mr. G. D. Ross), Fruit Expert (Mr. W. J. Allen), Dairy Expert (Mr. L. T. McInnes), Secretary to the Ministry (Mr. H. Luckman). Victoria—Director of Agriculture (Dr. S. S. Cameron), Superintendent of Exports (Mr. R. Crowe), Director of Horticulture (Mr. J. M. Ward), Chief Veterinary Officer (Mr. E. A. Kendall), Ministerial Secretary (Mr. J. Thynne), and Messrs. Meeking and Brown. Tasmania—Director of Agriculture (Mr. F. E. Ward); Fruit Expert (Mr. P. H. Thomas); Dairy Expert (Mr. T. H. Atkinson). Queensland—Under Secretary for Agriculture (Mr. E. Graham), and Mr. R. P. M. Short. Western Australia—Honorary Minister (Hon. H. Millington), Director of Agriculture (Mr. G. L. Sutton), Superintendent of Horticulture (Mr. G. W. Wickens), Superintendent of Dairying (Mr. P. G. Hampshire). South Australia—Minister for Agriculture (Hon. J. Cowan), Secretary (Mr. W. L. Summers), Director (Professor A. J. Perkins), manager, Government Produce Department (Mr. G. A. W. Pope), Chief Inspector of Stock (Mr. C. A. Loxton), Horticultural Instructor (Mr. G. Quinn), Chief Dairy Instructor (Mr. H. B. Barlow), Poultry Expert (Mr. D. F. Laurie).

Hon. J. Cowan (South Australia) presided.

The Minister expressed pleasure that the Hon. W. F. Dunn (Minister for Agriculture, New South Wales) and the Hon. H. Millington (Honorary Minister, Western Australia) were present, but expressed regret that the Hon. W. Slater (Minister for Agriculture, Victoria), Hon. J. Belton (Tasmania), and the Hon. W. Forgan Smith (Queensland) had not been able to attend that day.

KEY TO GROUP (See Plate 7).

Top Row (standing): Messrs. W. L. Summers (Secretary to the Minister, South Australia), J. M. Ward (V.), R. Crowe (V.), P. H. Thomas (T.), G. W. Wickens (W.A.), P. G. Hampshire (W.A.), Neale (V.), Davis (Chairman of Dried Fruits Board, W.A.).

Middle Row (standing): Messrs. Atkinson (V.), L. McInnes (N.S.W.), H. B. Barlow (S.A.), G. A. W. Pope (S.A), R. P. M. Short (Q.), W. J. Allen (N.S.W.), H. Luckman (N.S.W.), G. L. Sutton (W.A.), L. S. Smith (S.A.).

Seated: F. E. Ward (T.), E. Graham (Q.), G. D. Ross (N.S.W.), Hon. W. F. Dunn (N.S.W.), Hon. J. Cowan (S.A., Chairman), Hon. H. Millington (W.A.), Dr. S. S. Cameron (V.), Professor A. J. Perkins (S.A.), G. Quinn (S.A.).

The Hon. W. Slater, the Victorian Minister, had not arrived.

OPENING ADDRESSES.

Agriculture and the Empire.

His Excellency the Governor (Sir Tom Bridges), in declaring the conference open, said the delegates could do a great deal in forwarding agricultural development at the present time by exchanging views and experiences. It was of the highest importance of all States that they should get together on questions of agriculture and pastoral development, not only from the point of view of the States and the Commonwealth, but also from the point of view of the Empire. In Australia there were millions of acres of land, and in Great Britain there were thousands of people who should be on the land and helping to develop the resources of the Empire. There was no doubt that the question of the White Australia was bound up with the question of agriculture. That would be ascertained when they got into close touch at the conferences of the League of Nations. The question of a White Australia was always cropping up, and it had to be held down sometimes by force. It was a most difficult question, as they had a great many colleagues in the League of Nations who did not see why Australians should have such a great continent to themselves. Some of them were not of the same colour as Australians. Any steps made to increase the number of people on the land was a step forward in the solidity of the Empire and keeping a hold on Australia. He was pleased that the conference had been opened under such auspicious circumstances. A few days ago it appeared as though South Australia was in for a bad season, but now they were in a favourable position, and if they received rain over the pastoral areas they would be "in clover," as they had practically been since 1914. He felt that agriculture was the dominant economic interest of Australia to-day. The total production of wealth from all sources in 1925 was £449,000,000, of which £274,000,000 was contributed by agricultural and pastoral interests. Those figures spoke for themselves. It seemed to him that there were two methods available for increasing agricultural production. One was favourable legislation, and the other the application of science to production. He did not profess to be an agriculturist himself, but he had travelled a great deal about Australia, and he had always been struck by the fact that things needed speeding-up if they were to keep their place in the world's market. They had to cut their costs of production and introduce scientific methods. Those were the most important things that faced them to-day. He hoped their conference would be crowned with success, and that they would enjoy their stay in Adelaide.

Science and Increased Yield.

The Premier (Hon. R. L. Butler), in moving a vote of thanks to His Excellency, said the States of Australia were fortunate in having vice-regents who took an interest in agriculture and every other production that made for the welfare of the community. His Excellency realised that wrapped up with the question of agriculture were immigration and their great ideal of a White Australia. The latter could only be maintained by developing and populating the country with white people. He extended a welcome to the delegates from the other States, and said the application of scientific methods to agriculture was not only going to make for increased yield per acre, but was going to enable every State to open up and develop land previously thought useless. The conference, with its interchange of views, would assist materially in the carrying out of a progressive agricultural policy. The South Australian Government would at all times give serious consideration to the decisions of the conference. Their future was wrapped up in agricultural pursuits, as 98 per cent. of their exports were primary products. Although they realised the importance of secondary industries it was only by increasing production that they could pay their debts and fulfil their obligations to Great Britain.

Mr. Dunn (N.S.W.) seconded the vote of thanks, and said he was pleased to find that His Excellency was in accord with the views of his predecessor (Sir Archibald Weigall), who took a great interest in agriculture. They appreciated that representatives of the King took such a deep interest in the problems of Australia, and they expected His Excellency when he returned to be an ambassador for the Commonwealth. He (Mr. Dunn) realised that they must populate and extent their agricultural pursuits, if they wanted to "hold down" their ideal of a White Australia.

Mr. Millington (W.A.), who supported, said no Government would be fit to hold office if it did not do its utmost to promote the interests of agriculture. Western Australia was making rapid strides, and if he were asked for a reason for that he would say that apart from the enterprising people who worked the land it would be the application of up-to-date and scientific methods to the agricultural industry. To-day they were concentrating on greater production per acre, and in Western Australia they had now reached the 30,000,000 bushel mark. The wool clip was increasing, and in the fruit industry the production per acre in each district had increased not only in quantity, but in quality.

CONFERENCE PROCEEDINGS.

The Chairman, in welcoming the visiting delegates, expressed the hope that the conference would be profitable. He was proud of the work the department was doing in this State, and what had been done in the past would be excelled in the future. They were proud of the Waite Research Institute—a noble gift by the late Mr. Peter Waite, whose memory they reverenced. It would open up immense possibilities not only for the State, but for the Commonwealth.

On the motion of the Hon. W. F. Dunn (N.S.W.), the following committees were appointed to deal with the various subjects, with instructions to report at each day of the conference:—(1) Heads of departments, (2) dairy experts, (3) fruit experts.

Inspection of Exports.

Mr. Dunn (N.S.W.) introduced the question of the inspection of local produce prior to export. He said Commonwealth and State officials inspected goods before export. When in England he saw produce inspected by eight officials upon arrival. That was unnecessary overlapping. It was a Commonwealth matter, but the States were vitally interested. There were no inspectors in California. The exporters were licensed, and if the goods they sent abroad were not up to standard their licence was cancelled, and their bond estreated. It was only rarely that adverse reports on exported produce were received. The conference might consider it advisable to recommend something to the Federal authorities, and to secure fuller details of the Californian system, with a view to adopting a similar system in Australia. During the war canned goods in a faulty condition were sent to Great Britain, and Australia had not yet recovered from the harm those goods had caused to its reputation.

Uniformity Needed.

Mr. Millington (W.A.) agreed it was imperative that Australia should have a uniform system of inspection, and a most rigid one. Their reputation depended on the quality of goods exported. In the absence of an effective system it was bad business to export goods not up to standard. Anything to make the inspection more effective should have the approval of the conference. In India, because of climatic conditions, rust set in among tinned fruits, and steps should be taken to guard against this. If a hallmark were set upon Australian exports the overseas demand would soon increase.

Dr. S. S. Cameron (V.) supported, and said in California the fruit came to the exporters in very uniform grade, and there was little trouble. The keypin of the industry was the country packing shed. If a member of the Californian Packing Association failed to pack to standard he was expelled from the association, and then had to send his fruit to the brokers in Chicago, and be subject to victimisation. Members were therefore glad to get back into the association. Unless there were packing sheds in every district they would have to depend on inspection by the Governments.

Mr. Ward (T.) said he was pleased the subject was being ventilated, as there was constant friction between State and Commonwealth inspectors in Tasmania.

The Chairman said a great problem was to secure uniformity in packing and grading. Although they had an unnecessary number of inspectors, fault was still found in the products upon arrival in London. That apparently proved that the system was not efficient.

Mr. Ward (T.): There is war between the grower and the inspector.

The Chairman said the Californian system commended itself to many. It made the exporters responsible and eliminated the inspectors, which would tend to economy. They should direct the attention of the Federal authorities to the overlapping and to the system prevailing in California.

Mr. Graham (Q.) supported, and said the responsibility of the exporter at present seemed to be in obtaining a certificate.

Mr. Pope (S.A.) said the Government were asking the producers to organise as they did in California, and were offering an Export Control Board. Improvement in the quality of fruit sent overseas could only be obtained by growers organising and insisting that only the best quality fruit should be sent overseas.

Mr. Dunn moved:—"That the conference is of opinion that the present system of inspection has proved unsatisfactory and inefficient, and desires to direct the attention of the Commonwealth authorities to the necessity of ensuring that greater responsibility is taken by the exporter for the quality and grade of produce exported by him."

Mr. Ward (T.) seconded. Carried.

On the motion of Mr. Millington (W.A.) it was decided:—"That the State authorities be urged to popularise the adoption of improved methods of preparing and grading for market on lines similar to those which have proved satisfactory in other countries, with the object of making the exporters carry the full responsibility for the quality of produce exported."

Overseas Representation.

Regarding representation at overseas conferences, Mr. Dunn (N.S.W.) suggested that on the score of least expense one member should be selected to represent the whole Commonwealth; and that the Federal Government be asked to pay his expenses. If it did not agree, each State could contribute its portion.

Dr. Cameron (V.) concurred. He said since the war a lesson had been learned of a "get together move." It was vital to the progress of the Empire. Exchange of views was most desirable in primary and secondary industry, and in regard to scientific methods. Governments had been anxious for Australia to take its proper place in these conferences, but the question of expense had always debarred representation. If the Commonwealth would not provide the funds, the States should contribute on a population basis to send a delegate.

Mr. Millington (W.A.) said where the Federal Government had to foot the bill it would require the choice of a delegate. They would lose the control of securing a verbal report from the delegate, which was often more valuable than his written report. It was unsatisfactory to lean on the Commonwealth, and the States should make an effort to contribute, and select a delegate.

Mr. Dunn moved:—"That the conference considers it desirable that Australia should be represented at important oversea conferences dealing with agricultural matters, and that the State Governments be asked to co-ordinate with the Commonwealth with a view to selecting a representative, and that the States' contribution towards financing the expenses of the delegate be raised on a population basis, the selection of such representative to be determined by the State Ministers of Agriculture."

Conference decided that the Federal Government should be approached on this matter.

Rural Credits Scheme.

Mr. Graham (Q.) introduced the question of widening the scope of the Commonwealth Rural Credits scheme to provide finance for marketing and kindred activities. He said it was desirable that greater facilities be given. Finance was essential for the establishment of marketing boards, and must be available if boards were to function satisfactorily. The existing limit of twelve months was too short.

Mr. Millington (W.A.) said it would be preferable to ask the Federal Government to remove the limitation of a year. Better terms were desirable.

It was agreed to approach the Commonwealth Government.

Broom Millet.

Mr. Graham (Q.) moved for the maintenance of the embargo upon importation of broom millet. It had been said that the Australian production was inadequate for requirements, but it was not now the case.

Mr. Dunn (N.S.W.) seconded, and said the embargo was introduced to prevent the introduction of the pest European cornborer.

Mr. Millington (W.A.) wanted an assurance that the Australian States produced sufficient for requirements. It appeared to him that the motion was for spoon-feeding the industry.

Dr. Cameron (V.) said the question was not introduced for trade interests, as had been suggested.

The following motion was carried:—"This conference desires to intimate to the Commonwealth authorities that the assurance given by the States that sufficient broom millet would be produced in Australia for local requirements has been fulfilled, and the quantities produced this year will meet the stated requirements of manufacturers; further, this conference desires to emphasise the necessity, in view of the danger of introducing the European cornborer, of maintaining the embargo on the importation of broom millet.

Fodder Conservation.

It was decided that the matter of fodder conservation by the direct effort of the stockowner seems, in the light of present knowledge, to be the only practicable means of conserving adequate supplies of fodder to combat drought conditions.

Council of Research.

Professor A. J. Perkins (S.A.) favoured co-operation between the agricultural authorities and the Commonwealth Council of Scientific and Industrial Research. He said the main proposal was that the council should take part in agricultural research to assist industry. He moved that the conference endorses the agreement recently reached by heads of Departments of Agriculture and the Council of Scientific and Industrial Research relating to the prosecution of agricultural research by the latter body, and approves of payment to the council."

Mr. Dunn (N.S.W.) seconded, and the motion was carried.

Wild Dog Scalps.

Mr. Millington (W.A.) moved for the payment of a uniform bonus throughout the Commonwealth for the destruction of wild dogs in order to prevent trafficking in scalps. There was no doubt, he said, that trafficking would take place if there was sufficient inducement. Western Australia paid £2 a scalp, and the Northern Territory only 5s. a scalp.

Mr. Dunn (N.S.W.) said there were about sixty vermin districts paying varying rates in New South Wales. Although he did not oppose a uniform rate, he thought it impossible to put it into effect.

The Chairman said if £2 or £3 a head was paid for scalps, it would pay better to breed dogs than sheep. South Australia could not pay anything like the same rate as Western Australia and New South Wales.

Mr. Millington asked leave to withdraw the motion to make it the subject of negotiations between the States concerned and the Commonwealth.

Tubercular Cattle and Blood Stock Concessions.

On behalf of Victoria, the Director of Agriculture of that State (Dr. S. S. Cameron) introduced the subject of State Government administrative control of pleuro-pneumonia, and the influence of the Cattle Compensation Act in Victoria.

Dr. Cameron said Victoria was handicapped by the lack of uniformity in the control of disease in neighbouring States. However strictly Victoria might deal with the position, it was affected from time to time by fresh doses from over the borders.

Mr. E. A. Kendall (Chief Veterinary Officer of Victoria) said Victoria opposed the suggested reduction of from ninety to sixty days with respect to the period of quarantine of affected animals. Indeed, it was questionable whether niney days was sufficient. Not all the stock attacked by the disease died from it, and might recover unobserved by the person in control. That was where the risk was mainly run. It was no exaggeration to say that the only really safe method of dealing with the disease was to totally destroy affected herds. That, however, might be too severe in some cases, and should only be insisted upon where a big percentage of a herd was affected, or where there had been an outbreak in existence for some time before control was begun. Victoria felt that the other States should do something to fall into line with Victoria.

Dr. Cameron added that the operation of the Cattle Compensation Act had proved a distinct success in his State. The fund was subscribed to by stockowners, and the Government contributed 40 per cent. of the compensation for tuberculosis. The introduction of a compensation fund would be a really good thing, and would reflect credit upon the Governments of all the States.

The Chief Inspector of Stock and Chief Veterinary Surgeon for South Australia (Mr. C. A. Loxton) said such a fund would be of great benefit in dealing with the disease, but South Australia was largely importing cattle, chiefly from Queensland. While agreeing with Dr. Cameron's remarks, he felt that the absence of such an Act in South Australia did not prejudice other States.

The Hon. H. Millington (Hon. Minister for Western Australia) pointed out that there was no tuberculosis among cattle in his State, except a little in the north-west. Western Australia had adopted rigid measures to prevent the introduction of diseased stock to the State.

The Minister of Agriculture for New South Wales (Hon. W. F. Dunn, M.L.A.) said he could not promise that his Government would introduce an Act such as

suggested, because his State sometimes suffered from outbreaks of anthrax and other troubles, and the Government could not bring in a measure which would benefit only those stockowners whose cattle were suffering from a particular disease. His Government, however, opposed any reduction in present restrictions for dealing with the disease. The matter was serious, and experience might show that present conditions should even be tightened up.

The Under Secretary for Agriculture for Queensland (Mr. E. Graham) said the disease was Australian-wide, and any means of coping with it must also be Australian-wide, and operate uniformly in all the States.

The Minister of Agriculture for South Australia (Hon. J. Cowan) said he had been much impressed with the methods of compensation adopted in Victoria, and would give serious consideration to the possibility of introducing a similar measure for South Australia. There were difficulties, he knew, such as the compensation of owners of cattle only recently introduced to the State.

There was no opposition to the following motion by Dr. Cameron:—"That it be a recommendation that the method of control of contagious pleuro-pneumonia in cattle should be based on the recognition of the fact that all animals which recover from the disease are carriers of the disease, and a potential source of further outbreak."

Mutton Export Trade.

The manager of the South Australian Government Produce Department (Mr. G. A. W. Pope) moved—"That, in view of the effect on the mutton export trade of the British regulations prohibiting the importation of carcases with the lymphatic glands removed, it is desirable that the veterinary staffs of the States interested should co-operate in assisting research work now being carried out, with a view to preventing possible infection, and also curing the disease."

Mr. Dunn urged that the Commonwealth Government should get into touch with the Port of London authorities and endeavour to secure the removal or modification of the regulations. The embargo on Australian growers did not prevent infected mutton from other countries being placed on the London market.

Dr. Cameron said there was no scientific justification for the restrictions, as the ailment was not communicable to humans, and when the enlarged or discoloured gland was removed the carcase was no less fit for food than if a scar or cut left by a shearer was sliced off by the butcher.

Mr. Pope's motion was agreed to, as was also the following:—"That the Commonwealth Government be asked to again urge on the Port of London authority that, as this trouble exists in both England and Scotland, and is not communicable to man, the regulations prohibiting the import of carcases of sheep with the lymphatic glands removed should be relaxed."

Importation of Blood Stock.

The question of concessions in the importation of stud stock from Great Britain was raised by Mr. Dunn. Some of the shipping authorities, he said, had been opposed to carrying stock free, but he had met all the authorities recently in conference, and they had agreed that if the Federal Government paid one-third of the total cost of transportation from the farm in Britain to the farm in Australia, the shipping companies would charge no freight on stud stock. The shipping companies were anxious to encourage the production of better stock, feeling that it would mean more trade for them later on. The British Government was not averse to the scheme, and the idea was that the Government should pay one-third, the Commonwealth one-third, and the State concerned one-third after the stock was purchased. In agreeing to this scheme, however, the shipping companies were averse to encouraging mere speculators. It was desired to help only genuine buyers.

Mr. Dunn moved—"That this conference requests the Commonwealth Government to co-operate with the Imperial and State Governments and the shipping companies in assisting stockowners to import approved stud stock from Great Britain on the following suggested conditions:—The stockowners to bear the cost of purchase, the shipping companies to transport the stock free of freight, all additional charges, including rail freights, fodder, quarantine, &c., to be defrayed by the Imperial, Commonwealth, and State Governments concerned in equal proportions."

This was carried.

Plant Pathology and Grain Pickling.

The following recommendations of the committee, consisting of the heads of departments of the various States, were adopted:—

That a conference of plant pathologists should be held periodically to discuss problems arising out of the occurrence of plant diseases, and that the heads of

technical branches in the various States should meet at different times on the condition that it could be shown that there was need for such conferences.

That although work in connection with uniform standards for copper carbonate and other compounds for dry pickling of grain was not sufficiently advanced to admit of the fixing of definite standards, the work should be continued.

That a list of names proposed for new wheat about to be placed on the market should be forwarded to the Department of Agriculture of each wheat-growing State, and subsequently be brought up at the conference of Ministers of Agriculture for confirmation.

That the attention of the Commonwealth Government should be drawn to the fact that no action had been taken relative to the issue of regulations governing the grading of eggs intended for export.

That the departments concerned should enter into negotiations with a view to having official egg-laying competitions conducted under uniform regulations throughout the Commonwealth.

That the Departments of Agriculture should take steps to bring about a uniform or standard method of (*a*) classification of soils in connection with soil surveys; (*b*) determining the acidities of soils; (*c*) testing lime requirements of soils; (*d*) analysing pest destroyers.

That mesh sieves in use in Departments of Agricultural laboratories should be the standards of the Institute of Mining and Metallurgy.

Dairy Matters.

The dairy committee furnished a report in which it stated that attention had been given to the decisions of the previous conference (held at Brisbane). It was pointed out that the resolution on that occasion, referring to the advisableness of sending an officer overseas to investigate dairy matters, had not been given effect. The committee again recommended that the matter should be urgently attended to, and that the rotation of representation should be in accord with the volume of production in each State. In regard to the appointment of a joint committee representing New South Wales, Victoria, and Queensland, it was considered that if the joint committee investigated the efficiency of dairy machinery and reported upon it to all the State Departments, it would prove a useful guide. It was recommended that the joint committee should consist of the dairy experts of the States mentioned, and that it should meet at an early date.

All the recommendations were adopted.

Cheese Standards.

In a further report dealing with items set down on the agenda of the 1927 conference, the committee stated that it unanimously agreed that the following cheese standards should be adopted in State legislation, and that it should be a recommendation to the Commonwealth authorities for adoption:—

"Cheese shall contain no fat other than butter-fat, nor preservatives or any foreign matter other than rennet or salt, and only such colouring matter as, in the opinion of the Minister, is harmless, and shall comply with the following conditions:—

"Cream cheese shall contain not less than 50 parts per cent. butter-fat, and not more than 30 parts per cent. water.

"Whole milk cheese shall not contain less than 50 parts per cent. butter-fat in its water free substance, and not more than 37 parts per cent. water.

"Partially skimmed milk cheese shall contain not less than 20 parts per cent. butter-fat in its water free substance, and not more than 45 parts per cent. water.

"Processed cheese shall contain not less than 45 parts butter-fat in its water substance, and not more than 40 parts per cent. water.

"Soft cheese shall contain not less than 50 parts per cent. butter-fat in its water free substance, and not more than 45 parts per cent. water.

"Skim milk cheese containing under 20 parts per cent. butter-fat in its water free substance, and not more than 45 per cent. water."

The committee added that in the case of cheese the description should be set forth on the cheese itself, and on the packages or containers in clear and legible characters, words indicating the type of cheese.

The conference agreed to those recommendations.

The committee affirmed the desirableness of uniform certification of butter and cheese makers, and recommended that the State dairy experts should meet at an early date to formulate detailed proposals on uniform lines in that connection.

The recommendation was adopted.

Conference also endorsed a recommendation that a warning should be issued to all dairymen, against the use of preservatives in milk and cream, in view of the fact that from 1st July, 1927, no butter might be manufactured for export containing traces of preservatives.

Further to the items contained on the agenda, the committee recommended and conference agreed that the use of the word "butter" should be prohibited in connection with food products made from products other than butter-fat.

Improvement of Horticulture.

The following recommendations, which were contained in a report furnished by the committee of fruit experts, were approved:—

That as no action has been taken to obtain a report on the general trend of prices and conditions of fruit arriving on oversea markets, the matter should be again put before the Commonwealth authorities for favourable consideration.

That as, in each of the States interested, extensive experiments and research have been carried out in the life history of the codlin moth and its suppression, with encouraging results, the committee strongly recommended that progress reports should be printed by each State, and circulated among other States, and that the work should be continued during the next year, on somewhat similar lines.

Tobacco Growing—Investigations to be Made.

The Chairman also welcomed Messrs. H. W. Gepp (Chairman) and J. Gunn, of the Development and Migration Commission, to the conference, which then went into committee to hear addresses on tobacco-growing and proposed legislation on dried fruits by these gentlemen.

Mr. Gepp outlined important proposals for the advancement of the tobacco-growing industry in Australia.

The announcement created a good deal of interest, especially in view of the letter that had been recently forwarded by the Commonwealth Government to the various State Governments on the subject.

After referring to the letter, Mr. Gepp said he was now in a position to say that £90,000 was available for this work, while the British-Australian Tobacco Company was prepared to find more money, if necessary, to complete the work. (Applause.) For every million sterling of imported tobacco, £4 per week represented 5,000 breadwinners, or 20,000 people, and so the amount paid for imported tobacco would enable 60,000 people to be kept up by the industry if the money were kept in Australia. The consumption of tobacco increased as the population increased, and it was important that they should find a solution of their troubles. The evidence that Australian tobacco at present was not of such a good quality was conclusive. New South Wales was doing good work in an attempt to overcome some difficulties, especially in the matter of blue mould. There was, however, a great deal more to be done towards ascertaining the climatic conditions most suitable for the grower. In the first three years £30,000 would be spent, of which £20,000 had been made available by the tobacco company and £10,000 by the Commonwealth Government, while the States would be asked to provide only £1,000 during that period. It was certain also that if more money was required from the Commonwealth it would be forthcoming. Of the first £10,000, the Development and Migration Commission would supply £5,000, and a similar amount would be forthcoming from the Council of Scientific and Industrial Research.

Exhaustive Inquiries to be Made.

The organisation suggested, said Mr. Gepp, was an executive consisting of one representative each from the Development and Migration Commission (for which he had been nominated) and the Council of Scientific and Industrial Research, and a third man to be selected by those two bodies. The third man could be paid, if thought fit, in order that he might devote more of his time to the work of the committee. It was also suggested that directors of Government departments, or the nominees of Ministers of Agriculture, from the subscribing States should be formed into an advisory consultative committee. It was suggested that the work should be carried out both in regard to the whole of the economic, financial, and business side, as well as the scientific side. A careful selection of the experiences

of growers in the respective States would be collected and tabulated, and from them to ascertain certain lines of thought most likely to lead to results. There would also be a careful investigation of complaints of growers in regard to the purchase of their products by the tobacco company. It was only natural that under the conditions of the industry some growers would be disgruntled. The committee would inquire with expedition into such complaints, and would refer any necessary matters to the company.

Experimental Plots to be Established.

On the scientific side they had all matters appertaining to soil, climate, diseases generally, and curing. Details of the organisation would be discussed first by the executive with the consultative committee, and then it would be decided whether they would advertise elsewhere for the best expert. While that organisation was being arranged much work could be done in the collection and tabulation of data from the fields. Some of this work was now being done by the States, particularly in New South Wales, but it would have to be extended as advised by the experts. Types of tobacco would be brought from America in various stages of growth to enable comparison to be made with Australian plants, and it might be possible to grow Turkish and Egyptian varieties in addition to the Virginian types. The first consideration was to ascertain if they could replace the Virginian product. The results of the investigations would be extended to the States, all of which would have experimental plots established, not necessarily in the first year, but after some of the fundamentals had been established. Experiments would necessarily last over several years. Tobacco was grown in America in coarse soils, and where the humidity was high. So far the investigations into the control of blue mould were encouraging. He appealed to all the Ministers to approve of the idea so that they would feel that they had the backing and assistance of all the States in the matter. (Applause.)

Company will give Preference.

In answer to Mr. H. Millington, Honorary Minister in Western Australia, Mr. Gepp said he had the absolute assurance of the British-Australian Tobacco Company that they would purchase up to the limit of production and their demands the Australian product in preference to imported tobacco.

Mr. E. Graham, Under Secretary of Agriculture, Queensland, referred to the remarks of Mr. Millington, who had said that Queensland had been previously "frozen" out in the matter of tobacco-growing. He said that at the time referred to they were growing tobacco in Queensland with a certain degree of success, but, owing to the cost of production having increased much more quickly than in other parts of the world, they found it unprofitable to continue. If they had encouragement they would be able to grow tobacco at a more reasonable price, with the result that they could look forward to better methods being adopted by the growers, with better marketing facilities.

The Hon. J. Cowan, Minister of Agriculture, South Australia, said he hoped the States would co-operate with a view to promoting the industry. The offer made by the Commonwealth Government and the tobacco company was most generous, and he thought they would be lacking in their duty if they did not take advantage of it. (Applause.)

Fruit and Dairy Problems—Raising Dairying Standards.

Wednesday's session was mainly devoted to hearing addresses by Messrs. Gepp and Gunn, of the Commonwealth Migration Commission, and to the consideration of horticultural matters. Agreement was reached on many points.

Mr. Cowan welcomed Mr. W. Slater (Minister of Agriculture from Victoria), who had not been able to attend the conference before.

Mr. Slater returned thanks for his welcome. He was only a youthful Minister as far as Ministers were concerned. He had only been in office a week. The deliberations of the conference would be awaited with interest in Victoria, which State was vitally concerned in most of the matters under discussion.

Control of Stock Diseases.

Mr. W. F. Dunn (Minister for Agriculture in New South Wales) drew the attention of the chairman of the Development and Migration Commission (Mr. H. W. Gepp) to a resolution adopted by the conference on the previous day, in which the shipping companies agreed to transport stud stock free to Australia on the condition that the British, Commonwealth, and State Governments paid for the

other expenses, such as rail transport, fodder requirements, and quarantine expenses. He asked that the Commission should favourably recommend the proposal to the Commonwealth Government.

Mr. Gepp said he would be only too pleased to do what Mr. Dunn had suggested. While he was in London with the Prime Minister, they were approached with regard to helping the British producers of stud stock to overcome the difficulty of the embargo on foot-and-mouth disease. It would be disastrous if it was introduced into Australia. (Hear, hear.) The embargo had been lifted as far as Scotland was concerned, but it was still in operation in regard to England, but he would not like to take the responsibility of having it lifted from the latter country, as it was a matter for the experts to advise on. It was interesting to know that the Empire Marketing Board had offered financial assistance in this matter, and it was only necessary for the Australian Governments to confirm the arrangement to put it into operation.

Investigations in New Zealand.

Investigation was being made, added Mr. Gepp, into the conservation of fodder, and the results of certain experiments would be communicated to the States later. They should endeavour to raise the general average of the whole of the dairy industry of Australia. If they could get the Ministers of Agriculture to agree, it might be worth while sending one, two, or even three men to New Zealand to make a detailed report on the latest methods of dairying operating in that country. He would be glad if conference would consider if the action would be justified, as he was sure that if a recommendation to that effect was sent to the Federal Government the delegation would be sent. (Applause.)

Fruit Problems.

The committee consisting of the fruit experts from the various States reported that, owing to the varied facilities available for pre-cooling cargoes of apples prior to shipment at the shipping ports in the various States, and the absence of definite data founded on actual experiments, carried out with large cargoes carried between Australia and Europe, it was considered inadvisable to enact regulations and forcing pre-cooling. The committee, however, emphasised the desirability of tests being made upon commercial shipments. Holds capable of containing 10,000 to 30,000 cases each should be completely filled with pre-cooled fruit, as compared with a similar quantity of apples, which had been loaded in such a manner as to afford sufficient ventilation on the same boat.

Dr. S. S. Cameron (Director of Agriculture, Victoria) moved:—"That this conference considers it desirable that a system of pre-cooling of fruit prior to shipment be encouraged in all States where facilities exist." He did not think there should be such large experimental shipments, as suggested by the committee, because they might not be successful. They had no facilities in Victoria to carry out a scheme, but if exporters could get sufficient encouragement from this conference, it was quite possible that some small shipments of from 3,000 to 5,000 cases would be shipped next season. This, he contended, would provide more effective experiments than the one recommended by the committee.

The motion was carried.

The committee recommended the placing of distance reading electrically controlled thermometers at the principal points of critical importance in the holds of ships carrying fruit to Europe, and suggested that the conference should request the Federal Government to install them in the Commonwealth steamers.

The committee expressed the opinion that the question of uniform grade maturity standards throughout the States did not warrant all the States taking legislative action.

As experience had shown that unwrapped William pears kept better in cold storage, the committee suggested that the Commonwealth Government should be asked to allow those pears to be exported in an unwrapped condition.

In view of the Federal Government having presented grade standards for citrus fruits for export, it was recommended that the States should adopt similar grade standards for interstate trade, with provision for local requirements.

Effective methods of control of the root-borer had been discussed by the fruit officers of the various States, and it was agreed that investigations into the question should be undertaken in the States where such pests were prevalent.

The committee considered that it was desirable that the matter of a uniform system of variety branding abbreviations should be taken up between the States, which had considerable trade in fruit with each other.

The committee supported the request that the Council of Science and Industrial Research should be requested to investigate the different fuels at present in use,

or other possible sources of supply, with a view to providing a cheap and economical fuel for use in orchard heaters, which were used as a safeguard against frost injury.

The recommendations were adopted.

Increasing Home Consumption.

Mr. L. T. MacInnes (Dairy Expert in New South Wales) dealt with the question of the expansion of the home market and the limitation of imports covering milk, butter, and cheese. Australians, he said, now consumed 81,000 tons of butter a year out of a total production of 110,000 tons; so it would be seen that there was little left for export. In the official year-book of Australia, the consumption per head was 28½ lb. a year, but in New South Wales the actual consumption was nearer 36 lb. On those figures the other States consumed about 26 lb., but if they consumed the same as New South Wales, about 10,000 tons a year would be added to the total of 83,000 tons. The consumption of cheese here was the lowest in the world, being about 3 lb. a year for each individual. The consumption of milk per head was only a quarter of a pint per day, and it should be at least a pint. With a little organisation and propaganda the consumption of all these items could be greatly increased, and with the aid of a higher importation duty on these articles, a lasting benefit to the dairy farmers would be obtained. They would secure a local price more in conformity with the cost of production, and would thus be independent of overseas markets.

The Chairman remarked that in South Australia they had dairy produce departments, in addition to the Farmers' Union, and a company by the name of "Amscol," and the work of these concerns was quite up to date.

Mr. Dunn moved:—"That conference is of the opinion that steps and propaganda should be undertaken with the object of increasing the home consumption of dairy products, and also that the policy of marketing only the best grade produce should obtain."

The motion was carried.

Grade Standards.

Mr. E. Graham (Under Secretary for Agriculture in Queensland) moved:—"That conference reaffirms the desirability of fixing uniform grade standards for every kind of tropical fruit in all States."

Mr. F. E. Ward (Director of Agriculture in Tasmania) moved:—"That, in order to place the operation of the existing grade standards for fresh fruit on a more effectual and economic basis, each State maintain supervision over consignments exported to the other States of the Commonwealth to ensure that they comply with the requirements." He said Tasmania wanted all the States to adopt inspection before export.

Mr. H. Millington (Hon. Minister in Western Australia) said it would mean an increase in the inspectorial staff. That was a big matter in his State.

Mr. Slater said they had regulations in his State which met the position.

Other delegates said their States were meeting Queensland in the matter of the banana standard.

Mr. Ward withdrew his resolution, and the motion moved by Queensland was carried.

Rights of Propagators.

Mr. Ward moved:—"That consideration be given to the introduction of legislation which will protect the rights of propagators in the sale of new and improved fruit varieties."

Mr. Slater opposed the resolution, while Mr. Millington said such legislation would be contentious, and would be subject to much litigation. Even if they were favourably disposed to it, was it practicable?

Mr. Dunn supported those views, and the motion was withdrawn.

Quarantine Station for Plants.

Resolutions dealing with the establishment of quarantine stations for plants were submitted by Tasmania and Queensland, reading respectively:—"That the Commonwealth Government be requested to establish a central quarantine station for the introduction of new and improved fruits from countries upon which an embargo exists in respect to bacterial disease or fungus and insect pests"; and "Equipment of a quarantine station for plants in each State."

On behalf of Tasmania, Mr. Ward said America had adopted the principle with success, but in Australia they were now debarred from importing because of the danger of pests and diseases.

Mr. E. Graham (Queensland) said the Commonwealth Quarantine Act provisions covering the importation of plants were stringent indeed. It was difficult to comply with them in their entirety. Some of the States had the matter under consideration, especially the setting up of stations to prevent the introduction of diseases. In Queensland they could not avail themselves of the State provisions and facilities, as they were mainly concerned with tropical plants, although they were asking for the assistance of conference.

Mr. Millington moved an amendment reading:—"That the Commonwealth Government be requested to establish a quarantine station for plants in each State in co-operation with the State Agricultural Departments."

Mr. Slater seconded. It was necessary, he said, that the rigorous regulations should be enforced.

The amendment was carried.

Security Against Crop Losses.

Mr. Ward moved:—"That, in order to afford fruit-growing settlers security against severe crop losses from hailstorms, the Development and Migration Commission be requested to investigate the possibilities of inaugurating a system of insurance that will be applicable to the principal fruit industries." He said that, owing to the failure of crops in certain parts of Tasmania, the motion had been introduced. The system had been adopted in America, and, therefore, it should be practicable in Australia.

Mr. Dunn said several of the insurance companies now operating in Australia had adopted the risk, but the premiums were so high that unless the practice became general, the rate would continue to be prohibitive. If it were placed on a co-operative basis the rates would be reduced.

Other speakers were in favour of the motion, which was carried.

Duty on Bananas.

Mr. Millington brought up the matter of the duty on bananas imported into Western Australia from Java and the adjacent islands, and he moved that the Commonwealth Government be asked to remove the duty of 1d. per lb. as applied to Western Australia alone. The regulations, he said, inflicted hardship in his State, particularly in the north-western portions. The tariff, as far as those portions of the State were concerned, was purely a revenue tariff, because Queensland bananas were not being imported.

Mr. Dunn thought the Commonwealth should be asked to make the rebate, because the tariff merely protected the eastern States. Western Australia was thoroughly justified in asking for it. The duty of 1d. per lb. meant a tariff of 4d. a dozen.

Mr. Slater opposed the resolution, which he regarded as the thin end of the wedge. It was dangerous, he said.

Mr. Graham suggested that conference leave the matter to be settled between Western Australia and the Commonwealth.

Mr. Millington said he thought an expression of opinion from the conference would be helpful to his State. He moved:—"This conference is of the opinion that the rebate of the duty on bananas imported into Western Australia will not affect detrimentally the banana industry of the other States."

The motion in its amended form was carried.

Rough Handling of Cases.

Mr. Ward moved:—"That each State introduce legislation which will make it a penal offence for any person to handle or treat cased fruit in a manner which will be detrimental to the contents." He said such legislation was operating successfully in Victoria and Tasmania, and under those circumstances he failed to see why it could not be introduced in other States. Fruit cases received rough handling at the hands of railway and shipping, and other authorities.

Mr. Dunn: It will operate against shipping.

Mr. Ward: I do not think so.

The motion was rejected.

Tobacco Proposals.

Mr. W. F. Dunn (Minister of Agriculture, New South Wales) moved that the conference, having heard the proposals of the Commonwealth Government in regard to research into tobacco-growing, recommend to their respective Governments the acceptance of the scheme. It was a wise step to take, he said.

Mr. W. Slater (Minister of Agriculture, Victoria) seconded. The previous Government of Victoria, he remarked, had already accepted the proposals, and he could see no reason why that decision should be varied.

The motion was carried.

Dairying Problems.

The committee of dairying experts submitted a further report, in which they considered that the best system whereby Governments and farmers could obtain the most satisfactory results from herd-testing was that carried out by the Departments of Agriculture of each State with staffs under their direct control. While affirming the general principal for uniform application throughout Australia, it was recognised that it would be necessary to vary its application in accord with the different conditions which pertained within the State.

Regarding cheese standards, the committee recommended that those previously submitted should be forwarded to the administrators of the Pure Food Acts of the various States, and to the Minister for Markets and Migration, with a recommendation that they be adopted, with a view to securing uniformity among all authorities within Australia.

The committee also unanimously recommended the reaffirmation of a resolution passed last year that legislative action should be taken to control the use of sires for the improvement of breeding of grade dairy cattle, and that in giving effect to that resolution, a system of registration on the lines successfully put into operation in South and Western Australia should be adopted.

The recommendations were adopted.

Wheat Standards.

Mr. H. Millington (Honorary Minister, Western Australia) said it was reported that New South Wales had decided to adopt permanent standards for bulk wheat. He therefore moved—"That, in view of the decision of New South Wales to adopt permanent standards for bulk wheat and to submit them to each State, this conference recommends that each wheat-growing State should submit suggested standards for bag wheat, to enable both standards being submitted simultaneously."

Mr. Millington said it would not be long before the other States would have to fall into line with New South Wales and adopt standards for bag wheat, whether they liked it or not. However, that transition could not be rushed. By standardisation they could boost Australian wheat as the best in the world, and it might be an advantage over present f.a.q. standards.

Mr. Dunn (New South Wales) seconded the motion, and said any change as was suggested could only be brought about gradually. New South Wales passed legislation about twelve months ago for the standardising of bulk wheat.

Dr. S. S. Cameron (Director of Agriculture, Victoria) outlined his inquiries into the standardising of the bulk handling of wheat in Canada, and said he would hesitate in adopting the policy in Australia.

Mr. G. L. Sutton (Director of Agriculture, Western Australia) said Australian agricultural machinery had developed to such an extent that it made possible the cultivation of land previously thought valueless. Notwithstanding this, the standard of wheat was deteriorating, owing to the rubbish and unmillable materials contained in it. They were trying to improve their dairy produce, fruit, and so on, and there was no reason why they should not try and do the same in regard to wheat, which was one of the things of which they were proud.

Dr. Cameron objected to the statement concerning the deterioration of Australian wheat.

Mr. Millington: It is not the grain that is deteriorating.

Dr. Cameron said Australian wheat was the best in the world. A short time ago it was cabled to the papers that at an international show in the United States of America a sample of wheat had been pronounced the world's best because it went 65 lb. to the bushel. At the Shepparton Show in this State wheat was shown that went 71 lb. to the bushel.

The motion was carried.

It was decided to hold the next conference in Perth.

SNAKE SKINS FOR PROFIT.

Thus a Press message from Coolangatta:—

The remarks made by Mr. T. C. Beirne on his return from Europe regarding the popularity of snake-skin goods in Paris, and the possibility of developing a profitable trade between Australia and the Continent in this commodity was brought under the notice of Mr. G. T. Williams by a representative of the "Telegraph" (Brisbane). Mr. Williams, who is an experienced bushman from Victoria, is making his way to North Queensland with a view of selecting a suitable centre in which to secure skins suitable for marketing. During the past three years Mr. Williams has been engaged in what may be termed the "snake industry" in Victoria and parts of New South Wales, and during that period has captured a very large number of reptiles which he has had no difficulty in disposing of at good profit. Numbers of the reptiles were captured alive and sold to showmen and agents for zoological gardens, whilst several hundreds of skins have been tanned for commercial purposes. The variety most suitable for commercial use, according to Mr. Williams, is the carpet snake or rock python, which is found in large numbers in Queensland, and which lends itself to the tanning process more readily than any other variety.

Asked for a few hints to assist the amateur in preparing the skins for market, Mr. Williams said that the head of the reptile should first be removed, then, beginning at the neck, the skin should be turned back with the aid of a knife a sufficient distance to grip it with the fingers. By holding the neck down the skin then can be stripped off intact. Whilst the skin is inside out any adhering flesh or fat can be readily scraped off. The skin can be reversed by turning it on a piece of wire or a thin stick, beginning at the tail. To effectively cure the skin it is necessary first to deal with the thin outer skin which is shed by the reptile periodically. The best wash consists of 1 lb. of fresh lime in 4 gallons of water, which, after being left standing for two hours, is stirred up and the skin placed therein. The wash is then allowed to settle, but the skin is removed, and the mixture stirred two or three times daily. At the end of forty-eight hours the scales may be removed with a blunt knife or a piece of hoop iron. The removal of the outer skin in most cases improves the pattern and adds to its permanency, and increases the market value of the skin.

The next process is the treatment of the fleshy side of the skin with a solution consisting of equal parts of methylated spirits, glycerine, and water, which must be repeated after the skin has been rolled and allowed to remain overnight to dry. The softening process is effected with very fine sandpaper or pumice-stone by rubbing the inner side of the skin gently from the neck to tail. This portion of the treatment requires the greatest amount of care on account of the thinness of the skin.

QUEENSLAND TREES.

THE TALLOW-WOOD *(Eucalyptus microcorys)*.

By C. T. WHITE, Government Botanist.

The Eucalypts of Australia number about 250 species, of which, perhaps, about seventy occur in Queensland, many of these, of course, being common to Queensland and the neighbouring States.

The Eucalypts in themselves form a very natural group, but present many difficulties at any attempt to arrange the species into natural groups, each possessing a number of characteristics in common. The bushman's classification by barks is perhaps, as good as any. By this system the eucalypts fall into about five more or less natural groups—(1) The smooth barked trees or Gums proper, (2) the Boxes, (3) the Stringybarks, (4) the Ironbarks, and (5) the Bloodwoods.

The Tallow-wood does not fall naturally into any of the above, though placed among the Stringybarks. It differs from these, however, in the bark fibres being short and the outer ones inclined to be flaky.

The Tallow-wood ranges through New South Wales to Southern Queensland, attaining its best development under good rainfall and soil conditions. The wood is rather greasy, hence the local name. It is one of the best of the hardwoods, being very durable under exposure to the weather. It is greatly favoured for veranda posts and flooring. The Chief Engineer's Department of the Queensland Railways gives the average life of Tallow-wood sleepers at seventeen and a-half years.

The botanical name is *Eucalyptus microcorys* and refers to the similarity of the little cup fitting over the flower being the shape of a Greek fighting helmet.

Photo.: C. T. White.]
PLATE 8.—A FINE TALLOW-WOOD ON TAMBOURINE MOUNTAIN.

Photo.: Department of Agriculture and Stock.]

PLATE 9.—LEAVES, FLOWERS, AND SEED-CAPSULES OF THE TALLOW-WOOD.

FAT LAMB RAISING.

The subjoined note issued by the New South Wales Department of Agriculture will interest Queensland small flock masters and other small holders. Differences in local conditions will, of course, be duly regarded.

Pastoralists—those who raise fat lambs in particular—have begun to realise that it pays to devote a good deal of attention to the improvement of their pastures, both by the sowing of recommended grasses and by top-dressing the natural pastures with superphosphate. Light dressings of superphosphate—¾ cwt. per acre—have been found to be sufficient for the drier parts of the State, and its application results in the quality and quantity of the natural pasture being increased. Moreover, stock of all kinds prefer the top-dressed pasture because they have a higher percentage of mineral ingredients, and are more attractive and palatable to the animals.

Good feed and plenty of it is necessary at all times during the growth of the lamb. What the market requires is a plump, well-shaped, sappy lamb, weighing between 30 and 40 lb. The lamb can be heavier if it is not dry and old. Lighter lambs will also sell well if fat and plump. The main point is that the fat lamb must have plenty of bloom, and this can only be assured by giving them the best possible conditions right up to the time they are trucked.

Shortage of Feed Checks Early Growth.

Any check due to a shortage of feed means a decrease in the milk supply from the mother, besides a smaller amount of feed collected by the lamb itself from the pastures, and the lamb will never properly recover. The lamb must be grown during that season of the year when the best feed is available, and should be marketed before or as soon as the pastures begin to dry off. The drying off of the pastures will mean a drying of the lambs, and they will lose that sappy nature and bloom which is so desired. Over the bulk of the State where this class of sheep-raising is carried out, an autumn lambing will be found the best.

In the cold districts of the State, where lambing takes place in the spring, the lambs will be growing during the summer, and suitable summer crops should be selected and grown, which, in conjunction with the natural pasture and stubble, will insure plenty of feed to force the growth of the lambs. In these cold districts fodder crops or extra feed will have to be supplied to produce a satisfactory export lamb, as, besides the fact that the natural pasture in these districts is not of the best, the climatic conditions tend towards slow maturity and a small-framed animal.

In average seasons in the western and south-western districts there is usually sufficient rain in the autumn to insure a certain amount of growth in the pastures, but for the raising of fat lambs this feed should be supplemented by green fodder crops. In this way every opportunity is given the lamb to get a fair start. The crop should be ready for the ewes to be put into it just prior to lambing. This will increase the milk supply, and if alternated with natural pastures there should be abundant feed until the usual spring growth, when the fodder crop can often be allowed to grow up for hay or silage.

Crops to Grow.

In deciding what crop to grow for fodder the general farm practice should be considered. It should be made to work as part of a rotation of crops on the farm. Of those available, the most satisfactory is oats, which, besides providing a good bulk of feed, helps to counteract such wheat diseases as "take-all," &c. Skinless barley is also recommended, and provides particularly good feed. Rape, or a mixture of rape and barley, will give a great bulk of feed if the season it suitable for a good germination of the rape. Rape alone should be fed off with care or losses may occur from "hoven."

Grasses to Sow.

On the Western Slopes and in the Riverina, Wimmera Rye grass and lucerne have proved very successful, and the following mixture is recommended:—Lucerne, 3 llb., and Wimmera Rye grass, 3 lb. per acre. On soils too shallow for lucerne, sow Subterranean clover 2 lb. and Wimmera Rye 3 lb. per acre.

In parts of the North-Western and Central-Western Plains, lucerne 3 lb., and Wimmera Rye grass 3 lb. per acre is giving good results, especially on old cultivation paddocks. Where lucerne will not thrive sow from 4 to 5 lb. Wimmera Rye grass per acre. Certain native grasses, like Coolah (*Panicum prolutum*), Giant Panic (*Panicum antidotale*), Warrego Summer (*Panicum flavidum*), Native Millet (*Panicum decompositum*), Diffused Panic (*Panicum effusum*), and Wallaby or White Top (*Danthonia semiannularis*), have also proved promising under cultivation.

PLATE 10.—INTERSTATE DELEGATES TO PIG INDUSTRY CONFERENCE, SYDNEY, NEW SOUTH WALES, 7TH AND 8TH JUNE, 1927.

(For Reference, see page 51.)

PIG RAISING IN AUSTRALIA.

A COMMONWEALTH CONFERENCE.

At the instance of the Minister for Markets and Migration (Hon. T. Paterson, M.P.), a conference of representatives of the pig industry in Australia was held at the Commonwealth Offices, Commonwealth Bank, Sydney, on Tuesday and Wednesday, 7th and 8th June, 1927. The following representatives were present:—

The Commonwealth Departments represented by the Hon. the Minister for Markets and Migration (Mr. T. Paterson); the Secretary (Mr. E. J. Mulvaney, I.S.O.); Mr. L. E. Stevens and the Conference Reporter (of the same Department); Mr. P. J. Carroll, Chief Supervisor of Dairy Exports, Victoria; and Mr. J. M. Davidson, Commonwealth Veterinary Inspector stationed in New South Wales.

The State Departments of Agriculture represented by Mr. R. T. Archer, Senior Dairy Instructor, Victoria; Mr. L. T. MacInnes, State Dairy Expert, and Mr. J. A. Robertson, M.R.C.V.S., Herdmaster, Department of Agriculture, New South Wales; E. J. Shelton, H.D.A., Instructor in Pig-raising, Department of Agriculture and Stock, Queensland.

The producers represented by Mr. G. A. Bedwell, Victoria; Mr. J. A. L. Thompson, New South Wales; Mr. J. A. Heading, chairman of directors of the Queensland Co-operative Bacon Association (Murarrie), Queensland.

The Proprietary Bacon Factories represented by Mr. Allen (J. C. Huttons Proprietary, Limited), Victoria; Mr. W. J. Gale (Barnes Bacon Co.), New South Wales; Mr. T. L. Jones (Foggitt, Jones, Ltd.), and Mr. E. E. Forth (J. C. Hutton Pty. Ltd.), Queensland.

The Co-operative Bacon Factories represented by Mr. A. J. Cooke (Farmers' Co-operative Union Ltd.), S.A.; Mr. T. J. McGalliard (Gippsland Co-operative Bacon Co., Ltd.), Victoria; Mr. W. H. Clifford (Co-operative Bacon Factories Federation Ltd.), N.S.W.; Mr. H. M. Hart, chairman of directors (Darling Downs Co-operative Bacon Co., Ltd.), Queensland. Mr. O. C. Krimmer, of the same company, was present at the conference as a visitor.

The Australian Stud Pig Breeders Society was represented by the President, Mr. A. C. Stewart, of Victoria.

In opening the conference the Minister for Markets (Mr. Paterson) said that at the Animal Husbandry Conference, held in Sydney last September, a resolution was carried, partly as a result of which this conference had been called. The

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DESCRIPTION OF PLATE No. 10.

READING FROM LEFT TO RIGHT—

Front Row—Mr. L. T. MacInnes, State Dairy Expert, New South Wales; Mr. J. A. Robertson, Herdmaster, Department of Agriculture, New South Wales; Mr. J. M. Davidson, Commonwealth Veterinary Officer, Sydney, New South Wales; Mr. E. J. Mulvaney, I.S.O., Secretary, Department of Markets and Migration, Victoria; Hon. T. Paterson, M.P., Minister for Markets and Migration; Mr. E. J. Shelton, Instructor in Pig Raising, Department of Agriculture and Stock, Queensland; Mr. E. E. Forth, General Manager, J. C. Hutton's Proprietary, Limited, Brisbane; Mr. T. L. Jones, General Manager, Foggitt Jones, Limited Brisbane.

Back Row (*Standing*)—Mr. A. J. Cooke, representing Co-operative Bacon Factories of South Australia; Mr. M. Allen, representing Proprietary Bacon Factories of Victoria; ————, Conference Reporter; Mr. O. C. Krimmer, Darling Downs Co-operative Bacon Company, Queensland; Mr. H. M. Hart, representing Co-operative Bacon Factories of Queensland, also Chairman of Directors of Darling Downs Co-operative Bacon Company; Mr. J. A. Heading, Chairman of Directors of Queensland Co-operative Association, Murarrie, representing Producers of Queensland; Mr. P. J. Carroll, Commonwealth Dairy Branch, Victoria; Mr. L. E. Stevens, Department of Markets and Migration, Victoria; Mr. W. J. Gale, Barnes Bacon Company, Sydney, representing Proprietary Bacon Factories of New South Wales; Mr. J. A. L. Thompson, South Gundagai, New South Wales, representing Producers of New South Wales; Mr. T. J. McGilliard, representing Co-operative Bacon Factories of Victoria; Mr. W. H. Clifford, of Norco, Limited, New South Wales, representing Co-operative Bacon Factories of New South Wales; Mr. G. A. Bedwell, representing Producers of Victoria; Mr. R. T. Archer, Senior Dairy Instructor, Department of Agriculture, Victoria; Mr. A. C. Stewart, President Australian Stud Pig Breeders Society.

resolution was as follows:—"That in view of the unsatisfactory conditions which exist in Australia in the pig industry as regards breeding, feeding, management, and fodder organisation, and in order to assist in promoting an export trade in bacon, this conference urges the Federal Government to convene a conference representative of the pig industry to formulate plans for the organisation of that industry on economic lines." Since that date he had received a good deal of correspondence from those engaged in the industry who were anxious that such a conference should be called. To-day they had representation of all the interests concerned so far as they could reasonably do so within the limit of numbers. A few figures regarding the industry might be interesting. There were about one and one-eighth million of pigs in Australia, the number in each State approximately being:—New South Wales, 382,331; Victoria, 339,601; Queensland, 199,598; South Australia, 90,794; Western Australia, 74,316; Tasmania, 41,009; Northern Territory, 382; Federal Capital Territory, 343; making a total of 1,128,374. Great Britain imported about £66,000,000 worth of pig products annually. Of that amount about £23,000,000 was received from United States of America, £22,000,000 from Denmark, and of the remainder Canada provided about £8,000,000. Although United States of America sent a little more in total product than Denmark, she did not send nearly so much bacon, but more lard, fats, &c. Australian exports to Great Britain were only about £7,000. In 1925-26 Australia sent away 90,000 lb. of pork, but imported 500,000 lb. in hams and bacon, of which nearly 480,000 came from New Zealand. This present year, taking the ten months up till the end of April, Australia had exported about 450,000 lb. pork, or about five times as much as she did for the twelve preceding months.

"I notice," continued Mr. Paterson, "that Mr. Ross Grant, Commonwealth veterinary officer in London, expresses the view that frozen bacon tends to become rather tallowy in flavour, and he says that it would be much better if we concentrated our attention on frozen pork rather than frozen bacon.

"In opposition to that statement we learn from Messrs. Foley Bros., who sent a consignment of bacon away, that the report upon it was very favourable indeed. This is against the contention that was made that freezing bacon tends to give it a tallowy flavour. The Western and Murray Co-operative Bacon and Meat Packing Co., Ltd., experimented last year with 1,000 carcases of pork to Great Britain. Half of it was sent to London, the other half to Glasgow. It turned out very well indeed, and was favourably commented upon by the trade, which stated that it had never seen finer frozen pork either from New Zealand, North America, South America, or any other country exporting to Great Britain.

"There is another matter which I should like to mention. You probably know of the prohibition which Great Britain has placed upon the importation of bacon containing boric acid. It relates to butter from the beginning of next year, but to bacon from 1st July of this year. It has been said in some quarters that bacon tends to become slimy if it is not treated with boric acid. That again has been advanced as another argument which should assist in the endeavour to send away frozen pork rather than bacon.

"The Commonwealth Government, through the Council for Scientific and Industrial Research," added the Minister, "is very anxious to do what it can to encourage primary and secondary industries, and has made available £250,000 for investigations, in addition to £100,000 for an endowment fund from the interest on which young men will be trained in research work. That council has been asked to look into certain pig diseases, and has initiated certain investigations into paralysis in pigs. This is to be investigated at the Glenfield Animal Research Institute. Dr. Finlay has completed a survey of the animal industry (including pigs) in Tasmania, and his report is now under consideration by the Development and Migration Commission.

"The maize industry some months ago, which is carried on in the same States as the bacon and pork industry, decided to have a voluntary organisation consisting of State committees composed of six State representatives in Queensland, eight in New South Wales, and six in Victoria. From the State committees and from these committees two delegates were appointed to form the Australian Maizegrowers' Council. I think some organisation, loosely knit in character, which would embrace both producers and curers of the four States concerned, would be of benefit to the industry."

Federal Organisation Approved.

At the conclusion of his speech Mr. Paterson asked members of the conference to express their views as to the desirability of some form of organisation for the industry.

After exhaustive discussion, a motion was unanimously carried to the effect that a Federal organisation, comprising representatives of producers, proprietary, and co-operative bacon factories, and Government experts be formed with a committee in each of the States.

Consideration was then given to composition of the Federal and State committees.

After discussion, in which each of the representatives expressed their personal views, and, where possible, the views of the organisation they represented, the following scheme of organisation in connection with the industry was agreed to:—

(1) The organisation shall consist of the Council for the Australian Pig Industry with a committee in each State.

(2) The functions of the Council shall be (*a*) the organisation of the industry on economic lines; (*b*) the raising of the standard of production; (*c*) the promotion of the Australian and oversea trades; and (*d*) the development of the industry generally.

(3) The council shall consist of the following representatives:—(*a*) One from the producers in each State; (*b*) one from the co-operative bacon factories in each State; (*c*) one from the proprietary bacon factories in each State; (*d*) one from the Federal Council of the Australian Stud Pig Breeders' Society; (*e*) one from the Department of Agriculture from each State; and (*f*) two from the Commonwealth.

(4) The committee in each State shall consist of the following representatives, with power to add proportionately to the numbers:—(*a*) Two from producers, except in New South Wales, where there shall be three; (*b*) two from co-operative bacon factories; (*c*) two from proprietary bacon factories; (*d*) one from the Department of Agriculture; and (*e*) one from the Commonwealth.

(5) The members of the council shall be elected by and from the State committees, substitute or proxy to be allowed to act for any member unable to attend any meeting of the council, on appointment signed by such member, or failing him, by the secretary of his State committee.

(6) The producers' representatives on the State committees shall be elected as follows:—New South Wales: One by the New South Wales branch of the Australian Stud Pig Breeders' Society, one by the Farmers and Settlers' Association, and one by the Primary Producers' Union of New South Wales. Victoria: One by the Victorian branch of the Australian Stud Pig Breeders' Society, and one by the Chamber of Agriculture. Queensland: One by the Queensland branch of the Australian Stud Pig Breeders' Society, one by the Local Producers' Associations. South Australia: One by the local branch of the Australian Stud Pig Breeders' Society, and one by the Dairymen's Protection Association. Western Australia and Tasmania: One in each State by the State branch of the Australian Stud Pig Breeders' Society. One in each State by the appropriate association or interest in each State, such association or interest to be determined in the event of Western Australia and Tasmania deciding to join the council.

(7) The representatives of the co-operative and proprietary bacon factories shall be elected by the co-operative and proprietary factory organisations respectively, in each State.

(8) The State and Commonwealth experts shall be appointed by the State and Commonwealth authorities respectively.

(9) The expenses of the members of the council and of the State committees shall be paid by the respective organisations they represent.

(10) Until otherwise arranged, the secretarial and administrative work of the council shall be carried out by the Federal Department of Markets.

The scheme will be submitted by the Department of Markets and Migration to the interests concerned in the several States of the Commonwealth, and, if approved, they will be asked to form State committees and elect representatives to the Federal council.

The conference also discussed many matters of importance to the pig industry, including marketing, grades and standards, production, breeding, feeding, interstate carriage of pork and bacon, rail transport conditions, inspection and diseases of pigs. It was decided that these matters should be referred for closer investigation to the proposed council, when appointed.

Mr. Paterson expressed his gratification at the cordial spirit of co-operation between the representatives of the different branches of the industry which marked the proceedings of the conference, regarding it as a happy augury for the future of the proposed organisation.

STATE COMMITTEES.

Matters to be specially considered in the initial stages by the various State committees include—

(1) The organisation of the industry, including both home and overseas marketing.

(2) Grades and standards, especially as they apply to the possible export of frozen pork or bacon in the green (*i.e.*, salted but not smoked form) such bacon to be washed, dried, smoked, and finally prepared for market, overseas. The matter as to whether frozen pork or bacon provides the better market outlet is to be considered.

(3) Production and development of the industry in the several States, with the final linking up, if thought desirable, for export markets.

(4) Breeding, especially in so far as it refers to the correct type of pig for the markets referred to.

(5) Feeding, including the care and management of the pigs from birth to maturity, the various systems of feeding and handling to be investigated with all details of marketing.

(6) Education, especially in regard to methods of eradication of disease and to preventive measures generally, these aiming at an all-round improvement in the health of the pigs.

(7) General, including interstate transport of pork products; inspection fees; condemnation at slaughter and an investigation of the causes responsible for these losses.

A special study of the various breeds and crosses is suggested, this, in view of the fact that Danish and Irish breeders especially have found that large Yorkshire crosses have proved admirably adapted to the British bacon markets. Any other matters that may arise and be considered worthy of discussion at both State committee and Federal council meetings.

It was decided that for the time being the Federal council meetings will be held in Sydney on dates to be arranged after the various State committees have been formed and have elected their representatives to the Federal Council of the pig industry.

THE PIG SECTION AT BRISBANE SHOW.

E. J. SHELTON, H.D.A., Instructor in Pig Raising.

Special attention is drawn to the revised schedule issued by the Royal National Agricultural Association and to several new classes included for competition at the forthcoming August Exhibition in the section devoted to the various breeds and types of pigs.

Prominent among these new classes is "The Bacon Pig Carcase Competition," details of which are as follow:—

Bacon Pig Carcase Competition.

To take the place of Class 499 (which is cancelled), appearing on page 117 of the prize schedule.

Class 499.—Pen of three pigs of uniform type and conformation suitable for bacon curers. First prize, £10; second, £5; third, £2.

The date of birth and sex of each pig must be stated on the entry form together with particulars of the breed of the sire and dam, the objective being to assist in ascertaining the most suitable and efficient type of bacon pig. It is essential that full particulars of the foods used and methods followed during growth and fattening be supplied with each entry.

The exhibit shall be judged first as live animals for conformation and condition; second, after being killed and dressed, for suitability for the bacon curer. Points according to the maximum set out hereunder shall be allotted at each stage of judging. The prizes shall be awarded to the owners of the exhibits which were allotted the greatest aggregate.

The live pigs shall be judged on Monday, 8th August, at 10 a.m., then full fed in the presence of an official, and must not be fed between that time and removal of the single pig for slaughter. On Monday evening one pig shall be selected from each pen and weighed, and shall be removed to a bacon factory, killed and dressed,

then returned to the Show Ground, where it will be exhibited in a refrigerated show case. The remaining pigs (two in each pen) shall remain on exhibition until the conclusion of the Show.

The dressed pig will be taken over by the factory at current rates; others may be disposed of as the exhibitor desires.

Scale of Points.

	Maximum.
Appearance when alive (conformation and condition)	50
When killed and dressed—	
Firmness of fat and quality of meat	30
Length of back	20
Ham	20
Thickness of streak	15
Lightness of fore-end	5
Fineness of bone	5
Fineness of rind	5
Total	150

During the progress of the competition the following data shall be collated—viz., breed of pigs, date farrowed, sex, live weight immediately before removal from Show Ground, weight when dressed, loss from live to dressed weight, commercial value, foods used and methods followed during growth and fattening.

Entries for this competition close on Monday, 4th July. Entry fee 10s.; members half rates.

Litter Weight Contest

Another important addition to the pig section schedule provides for a "Litter Weight Contest," in which the sow is to be shown along with her litter, the litter not to be under three months nor more than six months' old at date of judging. This contest, running somewhat along the lines of the "Ton Litter Contests" of the United States of America, should be productive of a great deal of interest and should create an additional attraction for all concerned. Class number and details are as follow:—

Class 500a.—Best litter of pigs, judged in accordance with the following conditions:—Prizes, £20: First, £12; second, £6; third, £2.

The sow to be shown with her own litter. The litter to be the total number of pigs reared by the sow at one farrowing. The litter not to be under three months nor more than six months old at date of judging, and must have been inspected and earmarked by an official appointed by the Royal National Association.

Intending exhibitors must notify the secretary as early as possible after the birth of the pigs, so that inspection and earmarking may be arranged.

The objective of the contest is to determine the most efficient producers of fresh pork and bacon, and to determine the best methods of breeding, feeding, and management. Entries must be accompanied by a statement as to the methods employed, and foods used in the production of the pigs, together with a record of the breeding of the animal. This information is required for publication, and should be as complete as possible.

It will not be necessary to have the sow in other than good breeding condition, and for this year's Exhibition it will not be necessary that the sow or young pigs be pure bred, but the sire of the litter must be eligible for or registered in the Australian Stud Pig Herd Book.

The male pigs of the litter must be shown as barrows, and not as boars.

The litters will be judged as follows:—

(1) Suitability for fresh pork or bacon factory purposes.

(2) Early maturity.

(3) For judging purposes the following standard of weights will be used:—(*a*) Three months, 55 lb. average; (*b*) four months, 90 lb. average; (*c*) five months, 130 lb. average; (*d*) six months, 180 lb. average.

Entry fee: 10s. members and non-members.

Entries in this class closed on 15th June. Several litters have been entered, and it is hoped this will introduce several entirely new features and be a good start on a fresh line. The litters entered have already been inspected and reported on, and some really good pigs will be shown.

Model Bacon Pigs.

Another section of interest will be the non-competitive pen of model bacon pigs which be on exhibition daily. A lecturette thereon by the Instructor in Pig Raising will be delivered daily at times to be notified on a notice board at this pen. It is hoped pig raisers will endeavour to be present at one or other of these lecturettes, and that many questons will be asked and answered.

State Schools' Pig Club's Competitions.

For the benefit of State School (including Rural Schools) Pig Club members, a special section has been included in which each pig exhibited must be the property of a *bonâ fide* member of a Pig Club as per details herewith.

State and Rural School teachers and Pig Club members generally may obtain further information in connection with this competition either from Mr. J. Bain, secretary of the Royal National Agricultural Association, Courier Buildings, Queen street, Brisbane; from the Instructor in Pig Raising (Department of Agriculture and Stock, Brisbane); or from the Organiser and Instructor in Agriculture (Mr. F. E. Watt), Department of Public Instruction, Brisbane. Details of the classes are as follows:—

Entries close Monday, 4th July, 1927. Entry fee, 5s. each entry.

Each pig exhibited must be the property of a *bonâ fide* member of a State School Pig Club, organised and controlled by the officials of the Department of Public Instruction, and of the Department of Agriculture and Stock.

The School Pig Clubs are grouped into districts as follows—viz., North Coast, South Coast, Brisbane Valley, Fassifern Valley, Marburg; other districts as arranged.

Each district will be allowed up to two entries in each class. *Entries will not be received from individuals.*

In the stud classes both pigs in each pen must be of the same breed; the breed, date of birth, and pedigree to be stated on entry form. In the baconer and porker classes each pen of pigs may be any breed or cross, but must be uniform in type and conformation.

Pigs entered in Stud Classes 495 and 496 cannot enter nor compete in the Bacon or Porker Classes (497 and 498).

Class 495.—Two pure-bred boars, over four months and under nine months old; eligible for registration in the Herd Book. First prize, £5; second, £3 third, £1.

Class 496.—Two pure-bred sows, over four months and under nine months old; eligible for registration in the Herd Book. First prize, £5; second, £3; third, £1.

Class 497.—Three prime bacon pigs, actual live weight not to exceed 170 lb. on judging day. Breeding to be stated on the entry form. First prize, £5; second, £3; third, £1.

Class 498.—Three prime porker pigs, actual live weight not to exceed 110 lb. on judging day. Age and breeding to be stated in the entry form. First prize, £5; second, £3; third, £1.

Other Classes.

In addition to the above the pig section schedule provides numerous classes and liberal prize money for the various pure breeds of pigs and for baconers and porkers. It is hoped that several silver cups and trophies will be available in additon to prize cards, ribbons, and championships.

The Meat Industry Exhibit, in which a special section is being devoted to pork and bacon pigs, will be the most comprehensive display yet staged by the Association covering the meat industry, and it should prove of untold value in disseminating up-to-date information in regard to Queensland's live stock.

General entries in the pig section are timed to close on Monday, 4th July, 1927.

FALLOWING.

POINTS IN FIELD PRACTICE.

The subjoined note is taken from a recent publication issued by the New South Wales Department of Agriculture. Allowance should be made, of course, for seasonal and other possible differences in local conditions, which might affect the full application of some of the points set out.

That fallowing pays is generally admitted, but not every wheat farmer realises that unless the practice is carried out intelligently much time and labour is expended that could perhaps be more profitably employed in some other farm operation. Not only is time and labour lost, but the crop yield also suffers.

The production of a good fallow is only made possible by ploughing early, and following with a deep primary cultivation in the spring to bring all the clods to the surface, thus aiding consolidation, by judicious working of the fallow when necessary, avoiding the use of disc implements where practicable, and, above all, by maintaining a shallow mulch with a nicely-clodded surface, which will prevent evaporation of moisture and soil erosion.

When to Commence Ploughing.

As one of the main objects of fallowing is to store in the soil the rain that falls before the seed is sown so that it may supplement that which falls during the growth of the plant, the time of ploughing is governed largely by the incidence of the rainfall.

In southern portion of the wheat belt the greater part of the year's rain falls in the winter, and operations must be directed at carrying the rainfall of one winter through the following summer in order that it may be available in the soil in the autumn. Therefore, the land should be ploughed as early as possible, particularly in the drier districts. If possible all the ploughing should be completed by June and July. Experiments and observations have proved that, throughout most of the wheat belt, each month the fallowing is delayed means a reduction in the ultimate wheat yield. There is no doubt whatever that land fallowed in June and July will, other things being equal, give a better yield than that fallowed in August and September.

It is found that 4 to 4½ inches is a suitable depth to plough, and even shallower ploughing is satisfactory. In the drier localities an occasional slight variation in depth is all that is required to prevent the formation of a hard pan.

When to Harrow.

On most soils it is not advisable to harrow the land after this early ploughing. It should be allowed to lie in this rough state so that it can readily absorb moisture, also that weathering agents may act upon it. Practically no rain runs off a ploughed surface; it soaks in and is stored in the subsoil. Being rough and open, the land is also in a suitable condition to derive full benefit from the action of the air, frost, and sun. It is a mistake, therefore, to break down the comb with heavy harrows on most soils.

On some of the heavier and cloddier soils, however, harrowing after ploughing is sometimes advisable. If soils that are always rough and cloddy are harrowed down soon after ploughing, many of the clods will be considerably reduced in size, which is a great advantage, enabling the summer cultivation to be carried out without any inconvenience from overlarge clods. These rough, cloddy soils, if not worked down somewhat during the winter while moist, are very hard to deal with later. The clods become dry and hard in the summer, and none of the ordinary implements are capable of breaking them down to handier sizes.

Cultivating the Fallow.

Harrowing immediately after ploughing is not to be condemned on the self-mulching types of soil (such as black boree country), nor even on the red or brown semi-alluvial soils, small areas of which occur throughout the district. However, on all soils that set after rain and on which it is desirable to maintain a cloddy mulch, excluding the extra cloddy soils mentioned above), it is not advisable to harrow after ploughing, as this practice helps to make the surface too fine without improving the condition of the soil below the surface. When the soil begins to dry up in the spring (end of August or beginning of September), the fallow should be worked with a springtooth cultivator or similar implement so as to prevent evaporation and to prepare the soil for future workings. This first working should be deep. In fact, the cultivator should be set to the full ploughing depth. Fine points

should be used so that the clods will be brought to the surface while the finer particles of soil work to the bottom. tI is important that this cultivation be given before the soil begins to lose moisture by evaporation in the spring.

Subsequent working of the Fallow.

From this point nothing definite can be given as to the actual dates on which the different workings of the fallow should be carried out. All subsequent cultivations, however, should be not deeper than 2½ inches so that the subsurface soils may become consolidated. The grower will have to rely upon his own judgment in deciding when and how to cultivate from this point on till sowing time.

It is not advisable to work a fallow when it becomes too dry, as little benefit, if any, will result. The most suitable time for cultivation is as soon after rain as possible. It can definitely be stated that, other things being equal, a fallow receiving a sufficient number of cultivations will produce a heavier yield than one which did not receive so many. Cultivating the soil definitely increases fertility and makes possible the production of heavier yields, and, although it is not necessary to cultivate after every fall of rain occurring during the summer, it is advisable to work the land after every fall sufficiently heavy to form a surface crust. For this operation the harrows, springtooth cultivator, or rigid tine scarifier may be chosen according to the condition of the fallow, the type of soil, and the presence or absence of weeds. If the soil is medium to heavy loam and is free from weeds the harrow or springtooth cultivator would serve. If semi-alluvial brown loam, light red loam, or heavy black self-mulching soil, and free from weeds, the harrows would be the most suitable implement. If heavy red loam or clay country, or if weeds are prevalent, the rigid tine scarifier should be used. This system of cultivation is carried out until the sowing period approaches.

RETIREMENT OF MR. WINKS.

Mr. R. W. Winks, Senior Grader to the Department of Agriculture and Stock, retired on the 30th June last, through the operation of the age limit, after thirty-four years' service, he having joined the Department in 1893. In the Department Mr. Winks was first associated with "The Travelling Dairy," an institution that did so much to establish the dairying industry in Queensland. Subsequently Mr. Winks was appointed Dairy Instructor, and on more than one occasion had control of the dairying activities of the Department. On the passing of the first Dairy Produce Act in 1904, Mr. Winks took up the work of the grading of dairy products intended for export, and since then devoted his energies to that side of the industry. The introduction of a system of compulsory grading for butter was an innovation in Australia and was naturally resented at the time by many manufacturers and agents. It is a great tribute to the tact, firmness, and competence of Mr. Winks and those associated with him at the outset, that the value of the grading system was soon recognised, and was subsequently adopted by the Commonwealth, and is now unreservedly acquiesced in by all concerned.

In addition to his other public services, Mr. Winks inspected and reported on several properties submitted to the Government under the provisions of the Agricultural Lands Repurchase Act. In this capacity he reported on the agricultural possibilities of the country along the route of the projected railway from Degilbo to Gayndah, and was the first to call attention to the fine volcanic soil on the Binjour Plateau, then covered with dense scrub. The Plateau is now the centre of one of the most flourishing farming communities in the State.

Mr. Winks' valuable work for the dairying industry is recognised far and wide and the following recent reference to the part he played in helping to establish dairying in Queensland is typical of a general appreciation. It is from a former Chief Dairy Adviser and Expert, Mr. G. Sutherland Thomson, F.R.S., N.D.D., now Technical Adviser and Consultant in Agriculture and Dairying in London. He writes, *inter alia*, "We fought a good fight in Queensland and the fruits are being gathered to-day throughout Australia and also in other countries. Tooley street, London, once doubted us, to-day our work is understood and admired."

Mr. Winks comes of a grazing and farming family, his father being the late Mr. William Winks, of Peak Crossing, and formerly of the Darling Downs. In his youth Mr. Winks acquired a knowledge and love of the bush, which he has always retained. His other hobby is literature, and when we say that possibly his knowledge of English classic verse and prose may equal his knowledge of dairying, we are paying him no small compliment.

Plate 11.—Mr. R. W. Winks, who was Retired from the Public Service on June 30.

BANANA GROWING IN QUEENSLAND.

By C. N. FREEMAN.

In response to numerous requests we reprint the subjoined note on banana culture, which first appeared in our issue for December, 1924.

The principles of banana culture, as set out, have received the endorsement of the Fruit Branch of the Department of Agriculture and Stock, and are applicable to Southern and Central Queensland, and, with slight modification, the State generally. The instructions given and recommendations submitted cover every phase of profitable banana growing.

The information courteously supplied by Mr. Freeman, being the outcome of personal experience in the Kin Kin district, will be appreciated by both new and old established planters. His advice is sound, and is backed by practical and profitable results, and may be followed without hesitation by growers bent on securing a maximum of material benefit.—EDITOR.

Selecting a Site.

In selecting a site suitable for the growing of bananas great care should be exercised as this is probably the most important feature of the business. A rich friable scrub or bastard scrub soil above frost level is preferred, yet in some forest lands containing a quantity of rotten shale they are found doing well, but in any case there should be perfect underground drainage and the soil must be loose. The banana plant loves warmth balanced nicely with moisture both in the soil and atmosphere, and an easterly to nor'-easterly aspect, close to the sea, with a good annual precipitation, gives these requirements. In abnormally dry seasons well sheltered northerly positions are too hot, but in wet seasons the plant simply revels in the conditions as both heat and moisture are balanced. With the easterly aspect also a plantation is sheltered from the cold westerly winds, but sometimes exposed to the south-east weather prevailing in the wet season (January, February, and March) in which case a belt of scrub should be left standing. One must also consider the capabilities of the site in the transportation of the fruit to the road level.

The best time to fall the scrub is in May or June. It will then have time to dry and allow the bark of the logs to crack ready to be fired in suitable weather in October or November. After the fire all small pieces not burned should be picked up and the ground cleared as much as convenient, and the time thus spent will be well repaid later on. Tracks of from 4 ft. to 6 ft. wide should be made in easy grades to facilitate the drawing of the suckers at planting time and later on the fruit.

Holing.

In digging the holes it is advisable to use sight sticks and a rod cut to the required length for marking so as to get them in line and as near as possible the right distance apart. A big hole should be dug not less than 15 in. wide at the top and bottom, the depth governed by the class of soil. If it be particularly deep and loose 16 to 18 in. is advisable, and if inclined to bake, say, 15 in.; but no hard and fast rule should be set out when digging. In preparing a hole the top soil should be left at the top side as this can be used when planting the sucker. There is a diversity of opinion regarding the distance apart that bananas should be planted, and it is generally conceded that it all depends on the care and method exercised in the suckering. If planted 9 ft. to 12 ft. apart two or three suckers can be left to ratoon, but if planted from 6 ft. to 8 ft. one sucker only can be left, in such a way that one bunch only per year is harvested. The usual practice, however, is to plant 10 ft. to 12 ft. apart.

Selecting Suckers—Planting.

All holes should be dug before the digging of the sucker from the parent plant is proceeded with. Although a sucker takes considerable time to completely dry out or die it is advisable to plant as soon after digging as possible. In selecting a sucker for planting old stools that the grower has decided to allow to run out are preferred to take them from, but the plantation must be clean of weeds, diseases, pests, &c., and the sap flowing freely through the plant, and this time coincides with the time of planting—December-January. In any case suckers should never be taken from plants before or on their first bunch, as they are usually very soft and a great deal of damage is done to the parent and sucker owing to their depth in the ground. The type of sucker to select is one showing a big round corm and a short cone top with no leaves and about as large as the two fists together. It will be found difficult to obtain them all the same size, but desirable to have them as near as possible alike. The crowns of big suckers are satisfactory providing the centre is scooped out and only one leaf left and a good slice of the bottom cut away, as the best roots come away from the level of the eye. These crowns can be cut in two or three sections, providing there is an eye for each section. A good tool for removing the sucker from the stool is a wide spud bar with a long pipe handle. After digging, the roots adhering to the sucker should be cut close up to the corm without damaging it. Remove all eyes from the sucker also.

When planting put the side of the sucker that has been severed from the parent facing down hill so as when the plant grows and the young suckers appear they will be at the back of the plant. The soil on the top side of the hole can now be pulled in and tramped firmly about the sucker or crown, and in the case of very small suckers they can be completely covered but by not more than 2 or 3 in.; in any case the hole should not be filled, and as the suckers grow a hole similar in shape to a saucer should be retained around the plant. This will tend to keep the subsequent suckers and roots well down.

When to Plant.

As mentioned above, December and January are the best months to plant. In the first place the selected sucker is growing and all wounds to the corm will callous up and the plant will strike immediately. They will do this much earlier in the season and later too, but there are other considerations. It is found that the best bunches and best fruit are grown in January, February, and March, and this fruit when harvested for to five months hence will meet the best market, and the fruit can be allowed to remain until fully matured. There is no loss through ripening or boiling, and it will be found that it is approximately twelve months from planting to bunching time if planted at this time of the year. On southerly or cool situations it is preferable that all the planting should be done by the latter end of December. On eastern and warmer sites planting can be deferred until the middle or latter end of January. If planted at this time they will get the benefit of the wet season and be well established ere the winter arrives and will keep growing right through it, providing the situation is warm.

Keep the Plant Growing.

Immediately the planting is finished all weeds should be kept down and not allowed to seed, and the saucer around the stool retained. The plant should be kept growing and not have a check, as this is the most critical stage of its life. Where hard patches of soil are found they should be broken with a forked hoe and whenever holing, the ground must be hoed, and incidentally the weeds, and worked up as deeply as possible. If this is done each time, a deep mulch will be obtained that will retain all quick rains and danger of washing will be lessened. If the soil is inclined to set in spite of this, a good deep fork hoeing should be given in the winter time and the ground left in a rough state and worked down with subsequent chippings. As bananas are usually planted on hillsides amongst stumps, logs, and roots, horse work cannot be practised, and in any case it is undesirable as handwork will give better net results.

Suckering.

In September following the planting a number of suckers will have appeared around the parent. These must be thinned out according to distance apart of the stools mentioned before, and in the case of 6 ft. and 8 ft. plantings one good, deep, hard, cone-shaped sucker retained. If the eyes have been cut away from the parent before planting, and providing it was not large when planted, it will be found that the biggest sucker of the right type will be the one desired. One growing at the back

or side is preferred, but if in the front only it can be left, but all subsequent baby suckers of this should be grown at the back as the plant will work too shallow. In the case of 9 ft. to 12 ft. apart, one sucker of the right type left on each side, all others scooped out deeply and never chopped off with a grubber or bar. When in turn these suckers grow, one sucker each should be left. It will be found that before the end of the year more suckers have sprung up. These should again be removed so as not to hinder the growth of these selected. This will occur repeatedly up till winter time, and it is important that there should be only the selected suckers growing. No pruning or suckering should be done in the winter time.

When to Cut.

When the bunch is thrown, a strong prop about 6 ft. long should be inserted in the base of a leaf conveniently situated and the other end pressed firmly into the ground to support the sucker and bunch, and when the flower shields dry and separate from the stem they can be pulled out and the bud cut off the bunch when it has grown away sufficiently from the last hand of bananas. If the bunch is not sheltered from the sun by its leaves it is desirable to break down the last leaf and put the bunch completely in the shade. By doing this the fruit will retain a soft green, all the bananas fill evenly, and be protected from the strong rays of the sun. The fruit should never be cut until it is matured, and that is when they attain a full round appearance, the judgment of which is quickly acquired. In hot weather for far distant markets the fruit must be cut before maturity. In this case the hands should be broken into two small clumps.

Careful Handling Necessary.

After the bunch is cut the leaves of the stalk should be removed leaving the stem standing, as the root system of this will be utilised by the baby sucker and the residue contents absorbed by it. This is particularly valuable in dry time, and wonderful growth of the sucker will be noticed. The bunch should be very carefully handled, in the case of one being carried—by one hand on the stalk end and the other on the flower end. In the case of two, a yoke can be utilised or the bunches carried hanging down at one side, but never carried on the shoulder. Too great a stress cannot be put upon this as it is at this stage that the greatest cause of Blackend or ruptured stem is occasioned. The bunches should be put down carefully, preferably on their side on a thick heap of trash, and covered over with leaves to protect them from the sun.

Where it is possible the bunches should be conveyed to the shed per overhead wires, thus facilitating handling with a minimum of bruising, as the banana is the most delicate fruit grown, the slightest knock showing black after ripening. Where wires cannot be used a slide with well-padded sides and floor can be requisitioned. The bunches should be stood up and placed in firmly so there is no rocking. On arrival at the shed they should be stood up singly on bags to prevent damage to the bottom hand and never heaped one upon the other. If the bunches are allowed to remain over night they will toughen and there will be less staining after being cut off, but bananas will never sweat on the bunch. The hands should be cut off with a small piece of stem adhering so as they can be broken apart easily, and this should be done by a to and fro movement by the packer according to how the fruit lies on the hand. When the hands are cut from the bunch they can be graded as near as possible and placed concave downwards hand upon hand. The grower's packing shed should be floored and the walls built showing no cracks, yet having plenty of ventilation in the way of windows or shutters half way up the wall so as to allow a draught of air to be continually passing above the fruit, carrying away the carbon dioxide which emanates from them. This particularly applies to the summer season. The fruit so handled will be cool when placed in the cases.

Packing and Grading.

At the present time different markets are demanding a different way of packing bananas. It would be an advantage to everyone concerned if a standard pack was evolved and a case label or stencil showing the grade and number of bananas contained therein placed upon the case, as in the case of citrus, apples, &c., but whichever way they are placed in the case it should be done very carefully and tightly, and the grade true in length and circumference. The method which is proving itself on the Sydney market is the single pack, placed on their sides with the stem out, working from one end of the case to the other, reversing each row so that each layer is bound, and when the case is opened on its side for inspection the stem ends are pointing in alternate directions. This is an attractive pack with a big count and carrying well. For Melbourne the desired method is to start the bottom layer with two joined bananas one upon the other, packing very tightly, and subsequent layers in single hands of threes and fours placed concave downwards with singles to fill in where required.

Fruit needed to fill in centre space should be stood on their ends after two layers are packed and outside rows built up around them. In both cases the fruit should be packed tightly and brought above the case a little to show just a fair bulge when nailed up. The nailing of the lids should be done by the aid of a clamp and bumped down.

It is most essential that growers pay the greatest attention to the grading of their fruit, and only that of extra choice and choice quality be sent to the Southern markets. If the bunches are showing only a small percentage of choice grade it would pay the grower to put it on the closest market on the bunch.

When loading lorries or trucks place all cases on their side and not on ends.

Cultivation and Manuring.

After a period of time which is governed by seasons and environment, the banana plant works up very closely to the surface of the soil and becomes prone to the effects of adverse conditions which materially reflect themselves upon the quality and quantity of the fruit. It cannot be said that the soil has been depleted of all its plant food, or, in other words, "worked out" as the accumulation of humus in the form of leaves, bark, &c., from the original scrub or forest has been going on for centuries, but it seems a matter of cultivation and a short period of rest that is needed, together with the breaking up of the old plant and replanting to put matters right. We know that the arrowroot or any other bulbous plant will come almost out of the ground in a very short time, and that when the clumps are broken up and the ground well cultivated a second crop can be obtained almost as good as the preceding one. If the soil was well worked, planted with one of the leguminosæ order of plants, such as the cowpea, &c., eventually turned under in a green state, and generally rested for twelve months, the results would be even better. Whichever way is adopted the holes should be dug in a different place from where the old stools stood, and, after planting, an application of about 5 cwt. per acre of a complete fertiliser spread on the surface about 3 to 4 ft. from the new plant and worked in lightly. A mixture containing for its component parts sulphate of potash, with sulphate of ammonia or nitrate of soda next and a phosphoric acid manure to complete it, is necessary. There are brands on the market containing these. When replanting allowance should be made for the slowness in the growth of the plant compared with the virgin crop, and two months should suffice.

Manuring can be practised without replanting, and if this is desired two applications of the same mixture as above should be given, say, 4 to 6 lb. per stool spread evenly all over the ground, and if the ground has been well cultivated previously, chipped in lightly, but the two operations of manuring and cultivation could be done simultaneously. The fertilising mixture given above is quick acting, and should not be applied to a dry soil, and only when the plant has ample moisture requirements. The best months to fertilise are August and December.

Thoroughness the Watchword.

Banana growing is very fascinating as the plants respond to good treatment, and is the means by which a conscientious man with small capital can make a start on the land without having to wait very long for a return; and as it is usually carried on in districts with a good and regular rainfall, risk from failure through bad seasons is reduced to a minimum. But planters must apply themselves intelligently, make "thorough" their watchword, and do the right thing at the right time all the time.

THE JOURNAL ON THE "RENOWN."

In the course of a letter to the Editor from Perth, Western Australia, Mr. P. K. Hodgson, C.M.G., O.B.E., Private Secretary to His Royal Highness the Duke of York, referred very appreciatively to the "Queensland Agricultural Journal," copies of which he had seen.

"They are most interesting," he said, "and I will take an early opportunity of laying them before Their Royal Highnesses."

PRODUCERS' PROBLEMS.

COUNTRY INFLUENCES ON NATIONAL DEVELOPMENT.

Following are points taken from a recent public address of the Federal Treasurer (Dr. Earle Page):—As two-thirds of the present production of Australia and 96 per cent. of her exports were primary, the importance of country influence in the determination of a national plan could not be over-emphasised. Excessive centralisation, with consequent waste in the production and marketing of goods, seriously handicap Australia in world competition. Federation offered unique opportunities of bringing about practical decentralisation. The industrial revolution of the nineteenth century, which was founded on steam, drove the people into the cities. The industrial revolution of the twentieth centry, which tended to be an electrical development, might easily scatter the people over the countryside again, if a national view of industries could be taken and a national policy outlined. Country influences should be the most important in deciding the main lines of such a national policy.

Shortest Way to Market.

Most of the big development problems were interstate, continued the Treasurer. If they discuss irrigation, they found that the Murray River basin was in four States. When considering power-development, they saw that the headwaters of the Murray, the Snowy, and the Clarence, in each case, touched at least two States. They were not utilising some of the best natural ports, because they were on the borders of States, and because of an absence of an interstate and inter-district transport. The successful marketing of Australian goods depended on the shortest and most economical route to market being adopted and on the best means of distribution being devised. How could they ensure the prosperity of the countryside, stimulate the development of country towns, and maintain agriculture in its proper place? The first step was the initiation of a national plan of efficiency in production and marketing that would ensure balanced development. The tariff was used to afford protection to industry generally. They must therefore be prepared to frame a tariff which would protect primary industries as effectively as secondary, and would stimulate their consumption, while organising marketing and distribution to ensure the maximum return and the smallest margin of cost between the producer and the consumer. The more direct they made the road to market the better the farmer's position. The list of imports into Australia last year showed practically £12,000,000 of agricultural products and groceries. The necessity of bringing those goods into Australia indicated a lack of method.

Building Country Industry.

To be of the greatest value to the farmer, continued the Treasurer, the industries which would largely absorb raw materials in factories or would promote consumption of the necessaries of life should be located as close as possible to the source of the raw products. That necessitated building up country towns and creating new centres of commerce and industry and new trade routes. Power systems whose capital was founded on the public credit must be prepared to sell electricity at the same rate in the country centres as in the big cities. As differential railway rates had militated against country development, in the future they must fight for differential rates favourable to the establishment of country industries and manufactures. Proper allowance must be made for the healthier, cheaper, and better living conditions in the country in determining the effective wages to be paid in rural industries.

The first effort at a solution of the farmers' problem must be made by the farmer himself, though that effort must be backed by public action. Farming operations must show the greatest efficiency, from the beginning of production to the end of marketing, to show satisfactory final results. In Australia the individual pastoralist has shown what could be done by increasing the weight of his fleece by judicious breeding; the wheat farmer had increased the yield by scientific cultivation and wheat selection; the dairyman had systematically improved his herd, and what has been done by a few must be done throughout the whole of primary industry. Taxes must be adjusted according to the farmer's ability to pay and to the changing conditions of modern life. A graduated income tax to some extent straightened out some inequalities, but more should be done in the way of taxation concessions to the primary producer, especially as much as his product was exported and did not command an Australian price like the goods of the merchant or the manufacturer. The public could also assist the farmer by giving him appropriate machinery of finance and marketing. The Government, however, should give him every assistance to build up his co-operative movements which tended to help and benefit all other business interests in so far as they stabilised agriculture.

PLATE 12.—A COMPARISON IN BROOM MILLET BALING.

Top: How it should be done. *Bottom*: How it shouldn't. The picture shows how two separate consignments were received at the State Produce Agency, Brisbane.

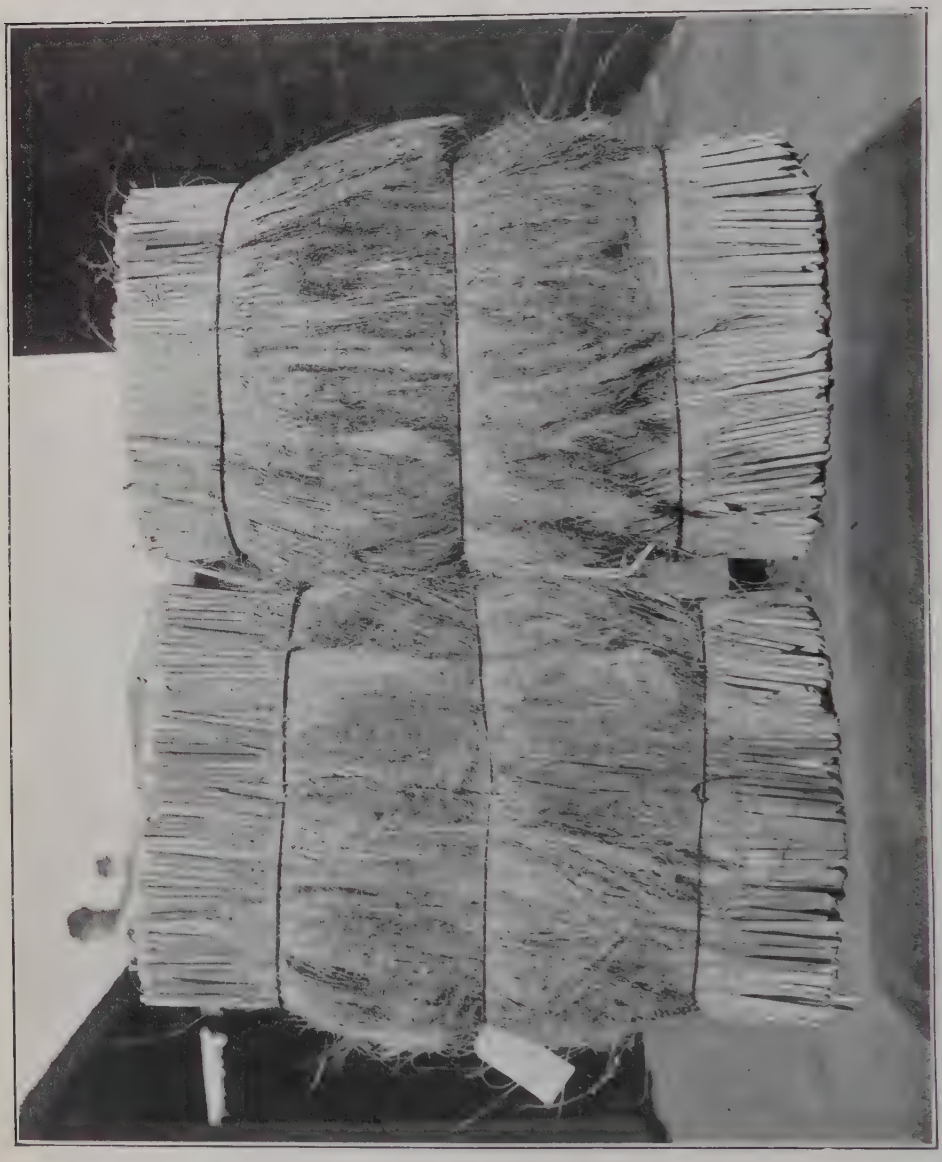

PLATE 13.—TWO WELL-PACKED BALES OF BROOM MILLET RECEIVED AT THE STATE PRODUCE AGENCY, BRISBANE.

PRESERVES.

By MARGARET A. WYLIE, Inspectress and Organiser Domestic Science, Education Department, Western Australia.*

The subject of fruit preserving is of interest to the keen housekeeper. Several methods occur instantly to the mind—drying, candying, and lastly, bottling, amongst others. The latter method will be the topic of these short notes. The primary object of all these methods is to so protect the fruit that harmful bacteria will be unable to cause decay, through the breaking down of the fibre bringing about fermentation.

"Processing" is the term applied to the operations of first sterilising, or sufficiently heating to destroy bacteria; and secondly, excluding air so that bottled or canned goods will keep. The utmost cleanliness must be observed in the care and attention to detail with regard to equipment, as well as to the actual "processing" itself.

Fruit.

All fruit should be prime and in full season, graded to suitable size for the bottles to be used.

Initial preparation consists in washing the fruit quickly, and then proceeding as follows:—

1. Peel apples and pears, and dip in salt water.
2. Quarter core, and pack as compactly as possible.
3. Dip peaches into boiling water. This ensures the skinning easily. Cut in half and remove stones. Pack compactly, overlapping edges.
4. If apricots and nectarines be large, cut and halve; plums and berries bottle whole.

Equipment.

The jars which are capable of being hermetically sealed give the greatest success. They are so constructed as to form a vacuum during the heating process. The inside air is driven off by the intense heat, whilst the pressure of the heavier air outside prevents the lid from lifting, ensuring that the contents are air-tight.

Full directions for preserving along these lines accompany Fowler's Sterilising Outfit.

Other bottles or jars in common use are glass-topped jars, provided with wire clamps attached to necks; also screw-topped jars with aluminium lids. New rubbers are essential. Secure the best and see that they perfectly fit the jars. They dry and deteriorate with age, even if only used once. The lids of the bottles should be carefully examined; any with flaws or even pin-prick holes should be rejected. Lacking a Fowler's Outfit one may use a large boiler, or washing copper, for holding the bottles during sterilisation.

Sugar is the great preservative, but water which has been sterilised, *i.e.*, brought to a boiling point, may be substituted if sugar is scarce. This latter is used in the form of syrup. A suitable syrup is made in the proportion of three or four pounds of sugar to one gallon of water—boiled for ten minutes, then strained, if necessary, and allowed to cool.

Procedure.

1. Fruit treated as detailed above and packed in the jars.

2. Pour over it the sterilised cold water or syrup, slowly, allowing liquid to sink well down, thus avoiding air bubbles. Fill to brim.

3. Fit on rubbers in groove of neck of the jar. Fit or screw lids evenly on top. A slab of wood should be placed at the bottom of the boilers to permit bottles to stand evenly, preventing contact with the boiler itself.

4. Place bottles in boiler, about one inch apart, in cold water reaching about half-way up the bottles. (No packing is required when the wooden slab is used.)

5. Bring water slowly to boiling point. Allow to boil half an hour, or longer for hard fruits. This is termed the quick method.

6. A slow cooking gives better colour, less broken fruit, and a clearer syrup, and is done by keeping the water round the bottles at simmering point for about two hours.

* In the "Journal of Agriculture," W.A., March, 1927.

7. Remove bottles, thoroughly tighten lids of screw-topped jars, and ensure that clips of the other types remain untouched, until fruit is perfectly cold.

8. Test jars to see if air-tight by turning upside down. If syrup oozes from lid, tighten again.

N.B.—When using screw-topped jars, it is advisable to have an extra bottle filled with syrup alone, sterilised with the others, and kept at same temperature. From this, the bottles of fruit may be refilled, if evaporation has taken place.

Reasons for Fruit Rising in Jars.—(*a*) Imperfect packing; (*b*) a sudden rise in temperature; (*c*) too great heat; (*d*) too heavy a syrup.

Other homely methods of bottling are as follows:—Proceed as above detailed in packing and using sterilised water or syrup. Then fill jars to overflowing; fix rubbers and lids; place in cold oven, light fire, heat gradually, and when fruit shows signs of slight shrinkage, remove from oven. Screw lids tightly, turn upside down testing for leaks, &c.

Still another method is to have two pans containing syrup. Bring both, at the same time, to boiling point. Into one, place just sufficient fruit to be thoroughly immersed, and cook till tender. Lift carefully, and pack cooked fruit in bottles. Fill with syrup from other pan to overflowing. Affix rubbers and rings, securing these tightly. This method is unique in that the fruit is only handled once.

The bottled fruit should be kept in a cool place till required.

PEANUT GROWING.*

An Australian market for the local grower seems to be now assured in the peanut-growing industry.

For the purpose of protecting the industry in this country from introduced diseases, the Commonwealth Government has prohibited the importation of peanut plants or seeds, except by permission of the Minister for Health.

The attitude of the Federal authorities is that the importation of peanuts should be discouraged as much as possible, and importers have been warned that permission to import will only be given in exceptional cases. As a matter of fact, importers have been advised to make arrangements at once for discontinuing importations.

The peanut-growing industry has always been retarded in Australia by the ineffective tariff on the nuts, which until recent years could be more cheaply imported from countries such as China, Africa, and Java. With an increase in the tariff, importers commenced to pay attention to the possibilities of fostering the local product, and with the partial protection thus afforded farmers attempted the growing of peanuts on a commercial scale. With the full protection now given the industry, the general prospects and market requirements are worthy of earnest consideration.

Market Requirements.

When a few years ago peanuts were used almost solely in the roasted form they were mostly imported from China, and about 1,500 tons were consumed in Australia annually. The consumption is still about this figure, but it is now about equally divided between peanuts for roasting and peanuts for the confectionery purposes previously mentioned. It is expected that when peanut butter, peanut flour, and the other manufactured products or confections become better known the demand for peanuts will increase greatly.

In America the per capita consumption of peanuts is about 10 lb. per annum, and if Australia used peanuts at the same rate the annual consumption would be 25,000 tons—more than sixteen times the present figure.

Moreover, in America, an area equal to that grown for the nuts is devoted to peanuts for "hogging down," and it is expected that this practice will increase in Australia when peanuts come to be grown on the poorer soils. A serious drawback to fattening pigs exclusively on peanuts is that they produce a greasy, soft pork, but this disadvantage can easily be overcome by supplementing the diet with maize and other feeds.

Under existing conditions in Australia it is very doubtful if planting peanuts on good maize land for the express purpose of feeding off would pay, when the ruling

*From notes recently issued by the New South Wales Department of Agriculture.

market price for peanuts and pork are about equal. Circumstances (such as a shortage of labour, an unfavourable market price, or a wet harvesting period) may arise which would make feeding off preferable to marketing the crop. Even when the most careful harvesting methods are practised a number of the nuts always remain in the soil, while others are left on the surface, due to shattering when handling the vines. These can be put to profitable use by turning the pigs into the paddock to clean up the residues. Whenever practicable, this system is worth adopting, for not only are the crop residues turned to profitable account, but the cropping capacity of the soil is also improved, both mechanically and chemically.

Buyers want High Quality Nuts.

The imported article is usually of high quality, being well graded by the cheap labour available in such exporting countries as China. Even though the competition of such countries has been eliminated, local producers must not imagine they will be paid the same price as was paid for the imported nuts unless their produce comes up to the same high quality. However, the price which is being offered at present has proved satisfactory to some growers, and farmers can best determine by growing an acre or so of peanuts whether the crop is more profitable to them than their usual crops.

A Sydney firm offered the following price, ex rail Darling Harbour, per the 1926 crop of White Spanish nuts according to grade:—Grade 1, f.a.q., containing 70 per cent. or more of sound No. 1 kernels, 4½d. per lb; grade 2, 65 to 70 per cent., 4d.; grade 3, not less than 60 per cent., 3¾d.

No. 1 kernels must be dry, mature, free from vermin mould, sticks, stones, and other extraneous matter.

The prohibition of imports coupled with the above offer should definitely ensure the establishment of a large peanut-growing industry in Australia, and there is no reason why, when the high value of peanuts as a food in the different forms becomes more fully known and appreciated, the industry should not become as relatively important here as it is in America.

As to details concerning the culture of the crop, growers and intending growers could not do better than consult officers of the Department of Agriculture, Brisbane.

PLATE 14.—WATER HYACINTH DEPOSITED BY FLOOD WATERS ON THE ROAD FROM SUGAR EXPERIMENT STATION, MACKAY.

POULTRY DISEASES.

By P. RUMBALL, Poultry Expert.

To the poultry-raiser the question of diseases and pests is of considerable importance, and that the economic effect of these troubles upon the industry is not lost sight of by the Department of Agriculture and Stock is instanced by the recent appointment of a committee to investigate and report upon the best lines of attacking the various diseases and pests which are common to the poultry industry in Queensland.

The personnel of the committee is:—Major A. H. Cory, M.R.C.V.S., Chief Inspector of Stock, chairman; Mr. C. J. Pound, Government Bacteriologist; Mr. P. Rumball, Government Poultry Expert; Mr. M. H. Campbell, chairman, Queensland Egg Board; and Mr. James Hutton, member Queensland Egg Board.

As an outcome of the committee's deliberation, articles upon diseases investigated will appear from time to time in this Journal, but the writer, in the interest of the poultry industry, desires to bring before the notice of poultry-raisers the necessity of taking measures that will increase the resisting powers of stock and methods that should be adopted for the controlling of disease when an outbreak occurs.

Diseases of all forms are caused by definite organisms. These organisms are frequently present in the soil or buildings upon the farm, or they may be carried from other farms by birds of the air, new stock purchased, crates, implements, &c. They may also be carried from a farm where disease is present to a clean farm by adhering to the clothing of the human being. Although disease organisms may be present it does not necessarily follow that outbreaks will always occur, although the chance of such is greater. The general health of the stock and sanitary conditions are the best insurance against outbreaks.

Correct feeding, freedom from internal and external parasites, and proper housing are conditions under which stock retain their greatest resisting powers against disease organisms and therefore are of primary importance.

Nutrition and General Stamina of Stock Important.

The nutrition of stock, more particularly during dry periods and high-priced foods, is an important feature. With the high cost of feed, breeders are possibly tempted to cut the ration down to a minimum, or feed inferior classes of food, with the object of reducing their feed bill. This frequently results not only in lowered production of adult stock, but, what is of greater moment, the under-nourishment of young growing stock with the consequence of the lack of physical condition. A long dry spell is also responsible for the lack of green feed, a food which is highly essential as an economical method of supplying an element of food known as vitamines. This element is necessary for the maintenance of the best physical condition. These combined reduce the resisting power of birds and make them easy victims to disease organisms; but it is not necessary that this should be so, as we have foods that will supply the wants in lucerne, chaff, or meal, buttermilk powder and cod liver oil. Buttermilk powder, it is admitted, is difficult to obtain at times on account of the effect of the dry conditions upon the dairying industry, but lucerne chaff of good quality is practically always procurable. Prices are high but its feeding value warrants its purchase, and the inclusion of, say, 12 per cent. in the ration will supply the requirements of poultry. This chaff is better soaked over night and fed with just sufficient bran and pollard to absorb the moisture.

Internal and External Parasites.

Worms, mites, and ticks are three of the most common parasites met with in the poultry industry. They individually and collectively cause a heavy mortality; the latter on account of the fever they cause and the two former on account of the weakening effect they have, thereby rendering the birds more susceptible to attacks of disease. They can, however, be kept in check, and mites entirely eradicated. It means work, but without work nothing can be achieved. However, in order to keep them in check, it is as well to know something of the habits and life history.

Worms.

There are many varieties of worms. One makes its home in the crop, another in the true stomach, another the gizzard, others the intestines, and others the blind gut or caeca. The round worm is the most prevalent and is responsible for most of the troubles due to worms among poultry. The life history of many is

PLATE 15.—PORTION OF INTESTINES OF FOWL INFESTED WITH WORMS.

This interesting photo. of worm infestation was obtained by the writer from a white leghorn pullet. The owner had requested the Department of Agriculture to advise on the treatment of his flock for roup. There was no doubt that the low condition of the birds was largely responsible for their susceptibility to the disease, and all those that were opened for examination showed severe worm infestation. Outbreaks of disease among such stock must be expected.

not known, but briefly that of those which are most common is: The egg is laid by the worm in the digestive tract, voided with the excreta, undergoes partial development in the soil, picked up by poultry adhering to particles of food, and incubation is completed in the digestive organs. Worm remedies are not too effective, 65 to 70 per cent. efficiency being given by some authorities, therefore the breeder should not pin his faith to medicants, but rather take precautionary measures.

Knowing that worm eggs are voided by infested birds it will readily be understood that a sanitary yard and feeding grounds will be one of the best methods to adopt. This method is fairly satisfactory with adult stock, but experience teaches us that young growing stock are very susceptible to the attacks of worms, they causing the birds to become very weak and in many cases are responsible for heavy mortality. Knowing this, we then should strive to rear our young growing stock upon land which has not been overrun with old birds, and the land should be spelled from one rearing year to the next.

Mites.

Mites are well known to most poultry-keepers, but the damage they cause is often overlooked, or it would appear so from the condition of many poultry houses. These mites not only come from their places of concealment during the night to suck the blood of their host, but when the house is heavily-infested they may be found upon the birds during the day. The sucking of the blood has a very weakening effect upon the bird, but it is possible that equal damage is done by the irritation and lack of rest they cause. They can readily be kept in check by attention to perches, nests, and broody hens. The broody hen provides a convenient host for the mite for the twenty-four hours of the day, which enables them to multiply more rapidly than otherwise; therefore, it is a good policy to have broody coops and to use them immediately broody hens are found. When the infestation is mild the painting of the perches with a little kerosene and waste oil will keep mites down. Wood-preserving oil and creosote are also very effective, but, if infestation is severe, weekly spraying of the house floors, &c., should be practised. The most economical spray is a kerosene emulsion. This emulsion is made in the following manner:—Boil up a pound of good soap in 1 gallon of water, when boiling remove from the fire and add 1 gallon of kerosene, stirring well to ensure a thorough emulsifying; to this another 8 gallons of water can be added. Use this spray freely; it is both cheap and effective. Soft water only should be used to obtain the best mixing of the water, soap, and oil.

The Poultry Tick.

The mortality the poultry tick frequently causes generally induces producers to give it a certain amount of respect, and the inclusion of it in the article is therefore not necessary. Producers, however, desiring information upon the tick should communicate direct with the Department of Agriculture and Stock.

Accommodation.

With the addition of large numbers of young growing stock generally present on the average poultry farm during certain seasons of the year, the housing accommodation is usually overtaxed. This means there is not the supply of pure fresh air in the sleeping quarters essential to maintain the birds in the best of health, and it is possibly due to this cause alone that many outbreaks of disease occur. The actual space required by the individual bird in a poultry house used for roosting purposes only naturally varies according to the length and depth of the house. We can, however, space our roosts at a definite distance and by doing so make for a better circulation of air, thereby ensuring to a large extent a pure air supply. Perches should be spaced at least 20 inches apart, the number varying according to the depth of the house. It is also as well to try and house young growing pullets in relatively small numbers—say, fifty in one shed. Whatever kind of shed is built, ventilation should be provided by leaving a space of 3 inches to 6 inches between the top of the back wall and the roof. The floor should be kept dry by providing good drainage, and finally the regular cleaning of the house and removal of droppings are essential.

Controlling Disease.

Owing to the relative low value of the individual bird and the rapidity with which disease spreads among poultry, more particularly where specialised poultry keeping is carried on, methods of control or the prevention of the spread of the contagion is of greater importance to the poultry-raiser than the diagnosis and

treatment. By this it is not meant that diagnosis and treatment are not necessary, but the prevention of the spread of disease is of major importance.

Diseases in poultry, as stated previously, are caused by a specific organism of some form, and it is known that disease is spread from bird to bird in most cases either through food and water supply coming in contact with excreta in which diseased organisms are present, or the food and water supply being contaminated by a mucus discharge from the eye, nostril, or mouth of diseased stock.

This being the case, it should be patent to any person engaged in the rearing of poultry that the removal of visibly-infected birds is the first essential, and that every effort must be made to detect sickening birds and to reduce the infection of premises and utensils to the minimum. To do this the following points should receive attention:—(1) Size of flocks, (2) housing, (3) feeding, (4) water supply, (5) disinfection.

Size of Flocks.

With commercialised poultry farming the birds are frequently kept in large flocks, and it is not intended in the following remarks to discount this economic principal of poultry farming. In a flock of, say, 100 hens it is relatively more difficult to detect a sick bird than in a flock, say, of 50, and it is therefore suggested that during outbreaks of disease of a highly-contagious nature the poultry farmer should endeavour to split his flock into as small a unit as possible, as the detection of the sick bird is of primary importance in preventing the contamination of the premises. It is recognised that on the great majority of poultry farms, more particularly during the season when diseases of an epizootic nature are present, housing accommodation is taxed to its limit; but even the partitioning off of houses and yards with wire-netting will suffice to split the flock into small numbers, thereby enabling the attendant to run his experienced eye over his birds in a few seconds every time he passes through the yards and houses.

Housing.

All types of houses and yards are met with, but that frequently used is the intensive house. Under the intensive system litter is provided to promote exercise, and under normal conditions it is left in the shed for several months. There are no harmful results from the practice under such conditions, but during an outbreak of disease the supply of litter should be limited and renewed every week. The floors of such houses are frequently the natural soil. This becomes under the best conditions contaminated to a depth of several inches, and occasionally 4 to 6 inches should be removed and new soil put in its place, but during an outbreak of disease this should receive attention after the removal of affected stock.

Where houses and large runs are used little in the way of treatment of premises can be practised while they are occupied with stock. Contamination is very widespread under such conditions, and the treatment of the soil in the yards is all that is possible. This treatment could consist, *after removal of all stock*, of spreading quick-lime over the pens at the rate of about a ton to the acre, but it is as well to add that quick-lime cannot be used in pens where stock are still present.

Feeding.

The method of feeding is either wet mash and grain or dry mash and grain. Wet mash is fed in troughs or receptacles of some form and allowed to remain in the pens for about an hour and that unconsumed removed. With dry mash, the hopper containing the food is open all hours of the day. With the wet mash there is a natural scramble of the healthy birds for this food, with a very poor chance of the sick bird getting near the trough until the majority of the stock have had their fill, while with the dry method of feeding the sick bird can go to the hopper at any hour of the day and contaminate the general food supply either by coughing infected material out—particularly is this so in the case of roup—or by excreting in the hopper. Knowing this it would then be a wise precaution to change from dry to wet mash feeding during outbreaks of disease, as it not only protects the food supply but permits of the feeding utensils being disinfected daily. The attendant also can more readily detect the ailing bird at feeding time, a healthy bird rushing the feed, while those not in such condition will be found to hang back. Then there is the practice of feeding grain in litter or scattered about the yard. This method has its advantage inasmuch that it helps by promoting exercise, or keeping the bird fit, but during the period when disease is present it would be better to feed grain in troughs than spread it among contaminated litter and soil. The drinking water can be considered one of the principal methods for the

transmission of all forms of roup, &c., owing to the fact that the water vessels are available to the fowls at all hours and the manner a fowl has of drinking. With most diseases a slight fever is generally present causing the fowl to make repeated visits to the water supply, swilling out her mouth and dribbling over the water, possibly contaminating it with thousands of bacteria. The medicating of the drinking supply with some substance which would destroy the organism would appear to be the solution of this trouble, but what of the effect upon the birds?

Any medicament of any value for the purpose of which the writer is familiar with makes the water that disasteful that the birds refrain from drinking, with the result of a very much reduced egg yield. Although spread of disease is checked through this source the financial loss to the poultry-keeper is generally more than he can comfortably stand. Medicating the water, therefore, is only advisable with young stock not in lay and birds which have gone off the lay on account of sickness. What has to be done with the water supply for layers is to renew it at frequent intervals, to disinfect the utensils, and to keep it in as cool a place as possible.

Disinfection.

The majority of poultry breeders use disinfectants freely. It is not so much the kind of disinfectant as the manner in which it is used that gives the results. For instance, if we run over the house, say, with a watering-can, giving the loose soil and excreta lying around a good sprinkling with any disinfectant used, how far will it penetrate?—in a state in which a poultry house should be, perfectly dry—no deeper than one-eighth to a quarter of an inch. This it will readily be understood is of little value. Diseased organism may be present several inches down in the litter and loose soil and is soon brought to the surface by the birds in scratching around. A good preliminary cleaning is essential before any disinfectant is used. Any litter and loose soil should be removed, all droppings cleaned from the perches and dropping boards, mixed with quick-lime and dumped upon the manure heap. If the floor of the house is of earth a few inches are better removed, and when this is done the poultry breeder can disinfect with the aid of a good forced spray with the knowledge that his work is being effectively done.

DURUM MAIZE.

A SPECIAL STRAIN OF SEED BEING DEVELOPED FOR THE ATHERTON TABLELAND.

Commenting on development work connected with the maize-growing industry on the Atherton Tableland, the Acting Premier and Minister for Agriculture, Mr. W. Forgan Smith, said recently that it was of interest to note that this was the first district in Australia to adopt modern methods for the treatment and storage of its maize in reinforced concrete silos, and up to the present it was still the only place where conveniences of this character had been installed, specifically for maize. The district is an exceptionally rich one, and is well served by rail and road communication with Cairns and the coast.

Although the average yield per acre of maize is higher on the rich volcanic soils of the Tableland than in other districts of the State, some little difficulty has been experienced in maintaining a hard-textured grain, and producing a type of maize plant possessing the botanical characteristics calculated to meet the existing climatic conditions.

For some little time officers of my Department have been engaged in developing a special strain of seed and type of plant for the Tableland, and in order that practical expression might be given to this very important form of research work, it was decided at the beginning of last season to initiate a Seed Maize Improvement Scheme for the Atherton district, and to engage in the production of supplies of seed for distribution each year.

Upwards of 50 acres were cropped this season, and I was much impressed with the sample of seed maize brought from the Tableland a few days ago by the Director of Agriculture. This strain, which is to be known as "Durum Maize," is of characteristic hardness and of excellent type and quality.

The good work already accomplished will be followed up. The Maize Pool Board at Atherton is keen in its efforts to advance the interests of growers, and to bring about that co-operative spirit which will lead to the consummation of my desire to encourage those engaged in this important industry.

It is not purposed to distribute seed maize for general planting from this year's crop beyond certain proposed extension work which the Department has arranged for.

Photo.: Department Agriculture and Stock.]

Plate 16.—Butter representing 189 different makes exhibited in the Butter-grading Room of the Hamilton Cold Stores at the recent Show conducted by the Queensland Butter and Cheese Factory Managers' Association, 1927 Annual Show and Conference.

Photo.: Department Agriculture and Stock.]

PLATE 17.—316 samples of Cheese exhibited in the Cheese-grading Room of the Hamilton Cold Stores at the recent Show conducted by the Queensland Butter and Cheese Factory Managers' Association, 1927 Annual Show and Conference.

ABSTRACTS AND REVIEWS.

All foreign agricultural intelligence in this section, unless otherwise stated, has been taken from the "International Review of the Science and Practice of Agriculture," published at Rome by the International Institute of Agriculture.

Preservation of Perishable Fruits and Vegetables.

Overholser, Prof E. L. (University of California). "Refrigerating World," vol. 60, No. 7, pp. 25-26. New York, 1925.

It is well known that fruits such as figs, apricots, and peaches cannot be kept long in the fresh condition at cold storage temperatures of 32 deg. F. to 35 deg. F.

The author carried out investigations from which the following conclusions were drawn:—

Strawberries, raspberries, loganberries, blackberries, cherries, figs, apricots, peaches, currants, and gooseberries, frozen at 10-12 deg. F., in water or sugar solution, or crushed with or without sugar, in closed containers, were kept for a year without deterioration of colour or flavour.

Freezing with dry sugar kept quickly-perishable fruits for use in pastries, ice cream, jams, &c.

Shelled fresh peas and asparagus have been frozen in water and subsequently cooked and have retained the flavour of the fresh material.

Fruits frozen in 30 to 40 per cent. sugar solution were as excellent as fresh fruit.

Cold Storage of Oranges.

Harrison, J. E. "Journal of Department of Agriculture of Victoria," vol. XXIII., Part 7, pp. 428-432, tables 7. Melbourne, 1925.

Experiments on the cool storage of Washington Navel oranges were carried out to ascertain the conditions which retard or develop the growth or mould in storage.

The value of sweating was studied; the process being carried out at a temperature of 70 deg. F., until the skin of the fruit was soft and pliable. Wrapping the fruit in paper had little influence on mould development.

As a result of the experiments it was found that:—

(*a*) The process of sweating offers the best means of guarding against the outbreak of mould in cool storage.

(*b*) An average temperature of 32 deg. F is unsuitable, owing to the danger of freezing.

(*c*) The average temperature of 34 deg. F. will avoid the danger of freezing and gives less mould than higher temperatures, and is recommended.

(*d*) The fruit from different districts varies in keeping quality.

Some Observations on the Condensation of Dew on the Land.

E. Bigini. "Le Stazioni Sperimentali Agrarie Italiane, vol. 59. Fasc. 4-5, 6-7. Modena, 1926.

Little is yet known of the amount of moisture which can be supplied to plants by dew, either directly through the leaves or indirectly by the earth. It is well known that there is a considerable condensation of dew in hot climates and it is apparently heavier in spring and autumn.

The author has carried out his experiments on various kinds of soil, particularly on red alluvial and tufa soils, in order to prove whether the formation of dew varies according to the composition and formation of the soil. His conclusions are as follows:—

The condensation of dew differs in a marked degree according to the nature of the soil. Red alluvial earth in every case condensed more dew than grey tufa earth. Just as a connection probably exists between the structure of the surface and dew, in the sense that heavier dew falls on more compact soils, so there may also be a connection with the contents of component parts which increase in volume with the absorption of water—*e.g.*, clay in as far as it retains water with greater tenacity.

There may also be a connection with heat, because dark soil heats more readily in the sun and cools more quickly by irradiation.

There was the greatest condensation of dew on nights with relatively low temperature, of higher relative humidity, with a wind velocity of less than 10 km. p. h., and a cloudless sky. There is also some appearance of a connection between the existence of dew and the direction of the wind.

Catch Crops for Cotton Growers.

Alternative Crops for Cotton Belt Farmers. Peanuts and Soy Bean. "The South African Cotton Growers' Journal and Sub Tropical Planter," vol. 3, No. 4, p. 43, Durban, 1926.

The peanut is eminently suitable for use as a catch or rotation crop in cotton areas.

Its uses are:—roasted for human consumption; source of oil for the table, for margarine, for soap; source of nitrogenous cattle cake after extraction; as hay or fed off *in situ*, both practices being common in America; belonging to the leguminosæ as enriching the N. content of the soil.

Climate.—Absence of frost essential during growing season of from four to six months, according to variety. Ideal is plenty of sun and heat, together with rainfall of about 15 inches, and dry period during harvesting.

Soil.—Ideal is sandy loam containing lime and organic matter. Prohibitive is badly-drained soil apt to cake.

Seeding.—Depth 3 inches, 30-35 lb. shelled or 40-45 lb. unshelled seed per acre. Seed bed carefully prepared. Planting in South Africa in October or November.

Fertilizers.—Phosphatics useful, say equivalent of 200 lb. supers per acre.

Spacing.—Determined by trial ranging from 18 inches to 36 inches between rows and 5 inches to 12 inches between plants.

Harvesting.—By hand or light plough.

Yield.—Average of fifteen bags of unshelled nuts per acre (one bag containing 70 to 80 lb.).

The Soy Bean is also used with success as a catch crop.

It is hardy and given warmth can withstand a considerable degree of drought or wetness. It is practically disease resistant.

It is an excellent soil renovator. Can be used for hay when cut soon enough or the beans collected and used in many ways as a highly digestible form of concentrated foodstuff. Growing period about 100 days.

Men, Trees, and an Idea.

ALLEN, E. T. "American Forests and Forest Life," vol. XXXII., No. 393, pp. 529-532. Washington, 1927.

In 1906 a handful of lumbermen in Idaho formed a forest fire protection organisation on the principle of co-operation between private owners, the various States, and the Federal Government.

The original idea was to form a properly equipped organisation supported by *pro rata* acreage assessment. Four such were formed, and immediately afterwards legislation enabled the State to join with its forested grant lands on a similar basis. Both the public and the forest owners at once began to show confidence in a movement which combined business competence with State authority.

Washington followed suit with a similar association, and in 1909 these five pioneer oragnisations formed the Western Forestry and Conservation Association, to extend the movement through the five Pacific Coast States, and to afford clearing-house facilities for associations, State forestry departments, and the United States Forest Service.

The five associations grew to thirty, stretching from California to Montana, all in the closest co operation with State and Government forest departments. Generally, men and money were pooled and legislation was promoted to forward this. Compulsory patrol laws were passed in several States. The Federal Weeks law funds were put at the disposal of the co-operative system in Oregon and Washington, with the consequence that in other States the annual appropriation for this purpose became greater each year. As a natural result in each coast State separately, and for the five jointly through the central alliance, nearly every detail of forest protection

was settled by conference of all three agencies—*i.e.*, the associations, the State forestry departments, and the Federal Government, represented by experts and by joint permanent committees working all the year. These conferences dealt with subjects of common interest such as—Safeguarding logging methods, slash disposal, trail and telephone building, possible use of wireless and aeroplanes, fire weather forecasts, standardisation of reports and wages, lookout and signal systems, publicity devices, and forest legislation.

British Columbia adopted the system. Eastern Canada was too far away, but as in New England and elswhere, timber owners in Quebec borrowed the idea and put millions of acres under similar protection.

One of the first steps of the Pacific Coast organisation was to develop modern publicity devices for educating the public in fire prevention. Fire prevention technique and equipment were developed by joint committees and covered by field manuals used by all forces. Fire weather forecasting was perfected by the co-operation of Canadian and American meteorological officials. Co-operative agreement made aeroplane assistance from the War Department possible.

Naturally, in course of time, such a scheme began to embrace all forestry subjects, silvicultural and economic. The forestry schools entered into the scheme. A joint forest policy committee pledged association, State, and Federal forest agencies not to promote independently any step that involved the others without discussion and an attempt at agreement.

The present co-operative protective system is financed as follows:—The lumbermen pay 71 to 74 per cent., the States 19 per cent., and the Federal Government 7 to 10 per cent. The range given is seasonal, and in bad years the lumbermen are sometimes obliged to increase their quota. But the public is the chief beneficiary in the end, and it is agreed that a fair distribution of expenditure would be half private, quarter State, and quarter Federal.

The same idea is extended to technical and economic affairs. The Western Forestry and Conservation Association maintains a research department to aid at actual cost owners wishing to investigate forestry possibilities. This work is performed in complete co-operation between the various forestry organisations—State, Federal, and private. There is a thorough interchange of ideas and devices. The Pacific Coast system has been increasingly recognised as a possible solution of the difficulty of uniting forestry interests in a common cause. The system was approved by the Senate committee on reafforestation, and in the form of the Clarke-McNary law is now the accepted national forest policy.

Twenty years' experience sees the Pacific Coast scheme becoming ever more successful. Deforested lands are being reafforested, old theories are falling before wider study and joint analysis, old controversies appear puerile in the light of actual experiment where methods are fitted to varying actual conditions. The result is both trees and men.

TANNING MARSUPIAL AND OTHER SKINS.

We have received numerous letters asking for instructions in curing and tanning these and other skins. The following recipes should prove satisfactory:—

The general principle is to trim off the useless parts of the skins and remove all fat from the inside. Soak the skins in warm water for about an hour; then apply a coating of borax, saltpetre, and Glauber's salts, 1 oz. of each, dissolved in sufficient water to make a thin paste. On the following day give a coating of a mixture of 1 oz. of sal. soda, ½ oz. of borax, and 2 oz. of hard soap. This latter mixture should be slightly heated without allowing it to boil. After this, fold the skin together and leave in a warm place for twenty-four hours. Then take 4 oz. of alum, 3 oz. salt, and 2 oz. of saleratus; dissolve these in hot water, and when cool soak the skin in it for twelve hours. Wring out, and hang up to dry. If you find the skin not sufficiently soft, repeat the soaking and drying two or three times.

Another method is, first to remove the flesh and fat. Then wash the skin in a solution of sal. soda and water. Take 4 oz. of powdered alum, 8 oz. of salt, 1 quart of new milk to 4 gallons of salt water, and 1 pint of prepared starch. Stir well, and then put in your fur skins. Air them often by hanging them over a stick laid across your tan tub. Handle them occasionally until they have been in the liquor for a day or two. Then remove the skins and add to your liquor a half teaspoonful of sulphuric acid. Stir this well into the liquor. Put the skins back and steam them well for about an hour. Then take them out and wring and rinse off in soft lukewarm water, and hang them up in a cool place. When they begin to get white, work and stretch them till they are dry.

Hides of larger animals, such as kangaroos, calves, &c., should remain longer in the solution.

To cure a tough skin, trim it on the flesh side with a sharp knife and then well brush with a solution of 2½ lb. of alum and 1 lb. of common salt in 1 gallon of warm water. The skin should be treated two or three times with this solution on successive days. Now sprinkle bran all over the skin, brush out, and nail the skin to a board to dry.

Note that each kind of skin requires some special treatment—that is, all skins cannot be tanned in the same manner, but the general principle is the same as above.

Still another method is by what is known as "the lightning tanning process," which is said to be the quickest method of tanning wallaby, rabbit, and other skins, and is very simple. It is as follows:—Pour 5 or 6 quarts of boiling water over 2 quarts of bran, and then strain the infusion. Make an equal quantity of salt water, by adding to blood-warm water as much salt as it will dissolve. Mix the bran and salt water, and to each gallon of the mixture (when no more than luke-warm) add 1 oz. of sulphuric acid (H_2SO^4). Immerse the skins in the liquor, stirring them occasionally until tanned, which will be in about twenty minutes. When tanned, rinse in clean water and hang out in a shady place to dry. Pull and stretch them well while drying. By sufficient pulling they can be made quite white. Dry skins should be soaked in warm water before tanning till they are quite soft and white.

GOOD ROADS AND RURAL DEVELOPMENT.

MOTOR VEHICLES AS FEEDERS TO THE RAILWAYS.

CLOSER CONTACT BETWEEN CITY AND FARM.

By J. H. GILBERT.*

Before the development of the petrol-driven motor and its application as the motive power of self-propelled vehicles over road surfaces the quality of the roads was not a matter of great interest. Steam and, later, electricity were being used in the transport of goods and passengers on rail racks. The slow-moving horse traffic was allowed to get along as best it could, and, although there were roads throughout the country, the money expended in their construction and upkeep was more or less begrudged by the average taxpayer.

Now that the roads are used principally by an ever-increasing number of motor vehicles, however, it is a different matter. People can now move along the highways and transport their goods at a rate of speed that rivals that of the steam and electric railways, but they want to do it in comfort, and on a smooth surface. The ordinary roads of the State are not only rough but dangerous to fast-moving traffic, and the wear and tear on the vehicle is very great.

The motor-car and motor-truck have demonstrated the fact that fast-moving vehicles travelling in every direction throughout the country districts are the means by which much of the country's produce is brought to the rails and thence to the seaboard. They are also a great factor in the distribution of the imports and food products to the people, even under the present bad state of the roads. When the condition of the highways is made good, there will be greater progress industrially and socially, and a greater impulse will be given to agriculture.

Although it is only fair that the general taxpayer should contribute to road improvement, as he will benefit by the increased prosperity of the State, the users of the roads should be the principal contributors by special taxation, such as license or fuel taxes.

Mr. Frank Page, chairman of the State Highway Commission of North Carolina, in "Public Roads" (a journal published by the United States Department of Agriculture), dealing with the wonderful development of the State of North Carolina during the last five years—since it has had the benefit of good roads throughout the State—the population of which is comparable with that of New South Wales, says:—

"£25,000,000 has been expended in highways since 1919, most of it since 1921, when we issued £10,000,000 in bonds, and later £7,000,000 more to build a State system of highways. The volume of shipments by rail has increased 20 per cent. since 1923 despite the fact that a big part of short-haul freight formerly handled by the railroad now goes by trucks. Tourists have been attracted. Hotels have

* In the "Farmer and Settler."

sprung up and the farmers of the surrounding country are growing truck produce to feed them. Unquestionably the passenger car and improved highways have greatly stimulated the travelling habit.

"Just as the State reached a point of progress that attracted capital to project electric interurban lines, the motor-car came into prominence, followed by the demand for road improvement. Many of the branch steam lines and short-line steam railroads have served their purpose. People seem to prefer to travel on the highways in their own cars and to use their own trucks. It is time we recognised this and educated public opinion to the economic waste in forcing these lines to continue operations at a loss when the same public, after voting to force continued operations, refuses to patronise the roads. The public must choose which type of transportation it wants, and if the choice favours the highway, there must be a closer co-ordination of rail and highway service.

"New fields of industry and agriculture are being opened, and the old fields are being stimulated immeasurably by the highway. It goes without saying that all this assures to the rail carriers much business and proportionate prosperity. We have increased our farms by 13,000, built schools to the value of £7,000,000. To these schools each day are brought 100,000 pupils in 2,000 school 'buses covering 40,000 miles. We have developed marketing associations engaged in shipping car-loads of poultry, eggs, hogs, fruit, and vegetables, that formerly we did not grow for outside sale. We have opened up parts of the State formerly foreign so far as transportation connections were concerned. The true value of property has multiplied eight times since 1900. We have built our State system and are maintaining it entirely at the expense of the road-users. The bonds are retired through a sinking fund maintained entirely by the motor taxes."

Commenting upon the same subject, Mr. William A. Graham, State Commissioner of Agriculture, says:—"The good roads in this part of the State have made it possible to supply the manufacturing cities from farms situated as much as forty miles away or farther. Before the advent of good roads the farmer that lived as much as 10 miles from town rarely took produce to market unless his roads were in what he would call prime condition, and then it took him an entire day to make the trip. The town was then forced to get its supplies from sources outside the State, as it could hardly draw on more than 75 square miles of territory for local production. With the coming of good roads the market gardens of the cities have grown from an area of 50 or 75 square miles to 1,000 to 1,200 square miles or more. Here we find diversified farming—cotton, corn, tobacco, potatoes, wheat, oats, and vegetables—all growing on the same farm the same year.

"New markets for farm produce have been created. Not the least of the advantages of these markets has been the social contact between the city and farm. Each has learned what the other is doing. The farm women use the receipts from their produce sales to buy conveniences for the farm home—clothing, books—everything they have wanted but could not get before for lack of funds. Incidentally, all these purchases make increased business for the railroads, waterways, and highways. The smaller cities in particular have felt the impulse to grow, called for by the improving of the highways connecting them with more prosperous cities. Now nearly all of them have new hotels, new business houses, municipal office buildings, paved streets, and better homes."

In Australia during the last few years, and especially during the last twelve months, the effectiveness of motor transportation in rapidly handling the harvest of wheat and wool under the adverse condition of bad roads has shown that it is possible to extend the wheat area very considerably beyond the present limits to which it is confined owing to distance from rail. If good roads be provided there is no reason that Australia's wheat production should not be doubled within the next decade. Money to build these roads should be readily obtainable, the more especially now that older countries have shown what motor traction has done for them in multiplying the country's activities in every direction, in rapidly adding to the value of its assets, and in greatly increasing the volume of traffic on the railways. An increase in traffic on the railways of 20 per cent. would make them pay.

It is a Federal matter. It has been taken in hand by the Commonwealth Government, and it is to be hoped that the work already begun will be pushed on with the greatest despatch.

We have a very extensive country to open up, but considering that at least the interest on the capital expended can be obtained from those that use the roads, there should be no hesitation in launching out on a big scheme of road construction. The amount of taxation that may be imposed upon the road-users will be more than made up by the increased life of their vehicles and the great saving effected in their upkeep.

THE INFLUENCE OF ACIDITY ON THE QUALITY OF BUTTER.

By C. McGRATH, Supervisor of Dairying.*

The earliest methods adopted in the manufacture of butter gave rise to conditions that ensured the ripening of the cream before manufacture. The setting of milk and hand skimming ensured the souring of cream before manufacture. The introduction of the cream separator and its use on the dairy farm was responsible for a rapid expansion of the dairy industry and the establishment of large central butter factories. The greater portion of the cream produced is delivered to the manufacturing centres in a more or less ripened condition. The consumers' palates from the earliest dairying period became accustomed to and appreciated the flavour of butter the product of high-acid cream.

In modern dairy practice the ripening of the cream and its influence on the immediate flavour of the product is well understood. Modern scientific research into the process of butter-making has demonstrated that the acid content of cream profoundly affects the keeping quality as well as the flavour of the butter produced therefrom.

Owing to the rapid expansion of the dairy industry the Australian markets were supplied and a rapidly increasing surplus of butter was available for export to oversea markets. In order to produce a butter that could compete in the world's markets, it was necessary that the process of manufacture must be on scientific lines, and this period marked the beginning of the science of butter-making.

The manufacturers and consumers were familiar with the important influence of acidity on the flavour of the butter, while scientific research yielded the knowledge that the acidity in the cream and butter greatly influenced the durability of the product.

Butter that does not possess keeping qualities and whose flavour changes rapidly or is not generally uniform in character is not suitable for export.

The marketing of our butter overseas and cold storage demanded a special characteristic—viz., keeping quality. The economic and hygienic benefits secured by submitting cream to a process of pasteurisation before manufacture became obvious. Butter, the product of unpasteurised fresh sweet cream, was found to be lacking in durability.

The separation of cream on the farm and its manufacture in large central factories is responsible for a portion of the cream supply being in a high acid condition on delivery at the factory.

If sour cream is submitted to pasteurising temperatures it frequently curdles or becomes ropey, and when churned fine particles of curd adhere to the butter granules and remain after washing, producing a butter with a high curd content and lacking in keeping quality, while the loss of butter-fat in the churning process is as high as 2 or 3 per cent.

The butter, product of cream pasteurised in a high acid condition, frequently obtains a scorched flavour and lacks storing quality.

In order to realise the benefits of pasteurisation it is necessary to reduce the acidity of the cream to a desired standard by the addition of an alkali. The neutralisers in general use are bicarbonate of soda (baking soda) (bicarbonate appeals owing to its being readily soluble and easily made up into solutions of desired strength) and lime hydrate (calcium hydrate) which is used in two forms—lime water or milk of lime. Lime water is very weak, and its neutralising power so slight that it is not so suitable as milk of lime as a neutraliser of cream. Lime is a suitable alkali for use. It is a natural constituent of milk. Milk contains slightly more calcium volume than does lime water, and should a small quantity of added lime enter into the composition of the butter it would not lessen its food value or healthfulness, and does not abstract any constituent of the cream or butter.

Correct neutralisation of cream by reducing acidity makes possible its pasteurisation without obtaining scorched flavours, ensures against excessive loss of fat in churning, and improves the keeping quality of the butter.

Neutralisation will not enable a factory management to make good butter from a low-grade cream. Poor cream always produces a poor low-grade product. Careful attention and accuracy is necessary in reducing the acidity of the cream in order to ensure the benefits of the process. The quality of cream must be definitely ascertained and the cream must be thoroughly mixed and a sample representative

* From an address delivered at the Annual Conference of the Queensland Butter and Cheese Factory Managers' Association, at Brisbane, 14th June, 1927.

of the whole taken. The test must be correctly carried out and the alkali weighed or measured, and be completely dissolved and thoroughly stirred into the cream. The effect of time and temperature on the neutralising action of the alkali must be considered. The partial neutralisation of sour cream permits of the pasteurisation process as used with sweet cream to be successfully applied.

Such processing, however, will not make a clean-flavoured sound-keeping butter from cream which is stale, fermented, rancid, or which has such defects as strong feed flavours, unclean, milking machine, or off flavours of a similar character.

Pasteurisation.

Proper methods of pasteurisation of cream ensure the destruction of the great majority of bacteria and other ferments contained in the cream. Pasteurisation will not make possible the production of a first-grade butter from low-grade cream, but it will improve the flavour and keeping properties of the butter, ensure more uniformity in flavour and quality, and make for the protection of the health of the consumer by the destruction of germs of human and animal diseases, and increases efficiency in the industry.

The reduction of the acid in cream and pasteurising process assist greatly in the production of a mild-flavoured butter of low acidity. Manufacturing conditions influence the amount of acidity in butter. Even though the right amount of acid is present in the cream at the time of churning the acidity of the butter may be too high if the cream be churned at a high temperature, or the butter is overchurned, or if the butter granules are not properly washed.

The serum of the cream is the main source of its acidity. If the acidity of butter is tested without a fat solvent like alcohol and ether, the acidity measured is practically all due to butter-milk.

Thorough removal of the butter-milk from the butter granules is necessary in order to produce a sweet butter possessing keeping character.

The process of churning results in the separation of the butter-fat from the caseous and serous parts of the cream in the form of butter granules. Under modern methods of manufacture the size of the butter granules can be controlled.

The butter-maker realises the importance of the correct size and uniformity of butter granules and the relation thereof to the quality and character of the finished product. In the process of churning, the small butter granules unite to form larger granules, and the churn is stopped when the granules are of the size desired. The spaces between the small granules that form the larger granules are filled with butter-milk. If the butter is overchurned the surface of the large granules is compressed to a greater extent than the surface of the smaller granules, and the removal of the butter-milk is difficult.

The wash water has a greater distance to travel and cannot pass as readily and as quickly through an oversize granule as through a granule of the size of a small grain of wheat. The smaller the granule the more complete is the removal of the butter-milk. If the granules are too undersized a loss is occasioned by their escaping through the strainers. A butter mass composed of very small granules drains very slowly.

If the churning ceases when the butter granules are very small, it is advisable to let the churn rest undisturbed for some ten minutes to give the smaller granules an opportunity to rise to the surface and adhere to the butter grains.

Washing.

Thorough washing of the butter granules in the churn has an important influence on the character and keeping quality of the butter. When the butter granules are the desired size, the churn should not be revolved unless the granules are floating on the butter-milk or wash water. If this precaution is not observed the mass of butter granules will fall with such impact as to become pressed together in a mass and the butter-milk will be sealed in the granules.

When the flow of butter-milk from the draining cock has almost ceased and the butter granules have settled to the bottom, the mass of granules should be sprayed with cold wash water.

When the drainings from the open taps become watery the taps should be closed and the necessary amount of wash water added, when the churn should be given a

few turns in slow gear. This wash water should be run off and another quantity of wash water added, and the churn again given a few revolutions in slow gear. This water in turn should be run off, and the working and salting of the butter proceeded with. It is necessary to wash the butter granules free from butter-milk, as the greater portion of the lactic acid and the majority of undesirable flavours are in the butter-milk. Careful washing of the butter granules assists in reducing acidity and off flavours and improves the character and keeping qualities of the butter.

Choice butter possessing keeping quality is the product of choice cream, correctly pasteurised and manufactured under conditions that allow of the removal of the butter-milk, and the proper working of the butter ensuring the desired body texture and condition.

NON-SETTING OF FRUIT—LESSONS TO BE LEARNED.

Non-setting of fruit has troubled orchardists generally during the present season, and explanations of the failure have been given some prominence. A typical instance of poor setting (of apples and pears) was investigated in the latter part of 1926 on behalf of members of the Batlow packing-house and the Batlow branch of the Agricultural Bureau. Thrips seemed to be the main cause of the condition in some fruits, but it was accentuated by: (1) Unfavourable climatic conditions during the blossoming period; (2) weakness of the blossom buds caused by the dry spell last January and February; and (3) carelessness in cultivation.

Conserve Soil Moisture.

A very dry spell was experienced last season, and consequently (and especially in cases where a grower had been careless in cultural work) the vitality of trees, especially of those carrying fruit, was adversely affected. Insufficient or neglected cultivation results in greater loss of soil moisture, which lowers the vitality of the tree, a condition that is reflected in weakness of the blossoms.

Trees which carried no fruit last year, and as a consequence bore a lessened strain upon their vitality, and also trees whose owners pursued sound cultural methods and thereby conserved sufficient soil moisture, set fair crops. Weak blossom buds take longer to develop than strong buds, and as a consequence the thrip has a longer period during which to carry on its destructive work; a strong blossom bud opens more quickly than a weak one, and fertilisation has more chance of taking place before serious damage is done to the organs of reproduction.

Combat Thrips.

Unfavourable weather conditions often retard the opening of blossoms, and in such cases also the thrip has a longer period during which to carry out its depredations. Frosts injure the essential organs of reproduction and prevent fertilisation, and also destroy young fruit after fertilisation has taken place. Cold winds and excessive rains greatly interfere with the activity of the bees, with consequently poor settings, and weak blossoms often fail to set fruit, no matter how favourable the conditions may be. There certainly was a combination of adverse factors at work at Batlow, but the predominant factor was thrips.

There is no doubt that here, as well as in other districts, insufficient attention has been paid by a number of growers to conservation of soil moisture and the maintenance of soil fertility. Good results can only be obtained by good cultural work, and by improving the physical condition of the soil by ploughing in suitable green crops. Such treatment would, of course, react favourably upon the trees and upon their crops.—"A. and P. Notes," N.S.W. Department of Agriculture.

"A VALUABLE JOURNAL."

A Mount Larcom farmer writes (23rd May, 1927): "Am a constant reader of the 'Queensland Agricultural Journal' and must congratulate your Department on the very high standard the Journal has attained. It is indeed of great value to me, and I cannot understand why it should need any advertising to get the farmers to take advantage of your very generous offer to forward the Journal for the cost of postage."

FARM TRACTORS—ENGINE EFFICIENCY.

By E. T. BROWN.*

The capacity for work of a tractor is stated in terms of "horse-power." If your outfit is not giving of its best you can reckon that some of the "horses" are dead. It is not my intention to discuss the question of the value of the unit which has been determined upon to denote the power of a tractor engine. That there are arguments for and against the horse-power unit is apparent to all, but I am not concerned with that side of the problem. I am, however, concerned with the question of the power derived from the engine. Every make of tractor is stated to be of a given power. It may be that the tractor you own or which you are operating is designed to give 20 horse-power at the belt pulley and 10 horse-power at the drawbar. Such an outfit is termed a 10-20 horse-power tractor. There is no question that such a machine can develop the power that is claimed for it by the makers. But it can only develop such power if the engine be properly adjusted and tuned. If it be otherwise you can take it that some of the horses are dead.

Tuning up.

It is nothing unusual for the motor cyclist or motorist to spend hours on end tuning up his machine. As a general rule, however, the object in this case is to secure a little extra speed. The object in keeping a tractor engine keyed up to the highest degree of efficiency is that more power at the drawbar may be available for work. An engine that is in perfect working order will develop more power than one that needs adjustment, and, moreover, the additional power is secured with a smaller consumption of fuel and oil. In this day of ever-increasing costs any saving effected, especially when combined with increased power, is a point for which one should strive.

What Kills the "Horses"?

There is a number of ways in which the efficiency of an engine can be reduced. The causes are simple in themselves, but they exert an influence greater than would be expected. They are simple causes; it is usually simple to correct them. In the first place, it may be the fuel supply that is at fault. The presence of dirt in the fuel pipes may cause a partial stoppage, with the direct result that the feed is intermittent. Again, the fuel valve may not be properly adjusted, in which case the quantity of fuel supplied is either too little or too much. Secondly, the engine may be over-heated. This may be due to a variety of causes, but, as a general rule, it will be found that the water circulation in the cooling system is imperfect. The use of dirty water, and after a time the use of hard water tends to clog up the tubes of the radiator and the water jackets.

Thirdly, the ignition may be at the root of the trouble. The spark gap may be too great on the sparking plug or it may be too small; the plugs may be dirty or faulty; the primary terminal of the magneto may be dirty; or the spark may be set too late, or it may be weak. Fourthly, it may be that the engine is not receiving sufficient oil, or that a wrong grade of oil is being employed. The greatest care must be exercised in the selection of a lubricating oil that is specially adapted for the type of machine in use. Lastly, the compression may be poor. Low compression is generally due to one of the following causes:—Accumulation of carbon deposit under the valves; incorrect adjustment of the tappets; sticky valve stems; bent valve stems; and dirty or broken piston rings.

Keep all the "Horses" Alive.

The various causes that have been suggested as making for an inefficient outfit can very well be done away with. It is quite within the knowledge and skill of the average tractor operator to tune up his engine in such a way that every "horse" is kept not only alive but vitally active. By a slight adjustment here, or the removal of a little dirt there, or the use of a better, higher-grade lubricating oil, the efficiency of the engine may be increased enormously. It lies in the hands of the operator whether the engine delivers power to its full capacity or not. If otherwise, it means that the operator and not the engine is to blame. Learn the individual characteristics of your outfit and humour any special traits that it may possess by tuning up according to its own peculiar needs. In this way, and in this way only, can you make sure that none of the "horses" are dead.

* In the "Farmer and Settler."

SNAILS AS AN ORCHARD PEST—CONTROL MEASURES.

Snails are well known as enemies of the vegetable and flower gardens, but they showed up recently at Gosford (N.S.W.) as a pest of citrus fruits. Holes were eaten in the oranges just colouring, and a fair quantity of fruit fell from the trees. Navels suffered to the greatest extent. The foliage was also attacked by the snails in some cases.

Though snails have been known to damage fruit trees on other occasions, such happenings are rare, and, in the most recent case, was associated with very heavy weed growth following excessive rains.

Investigations made in the affected district showed the grass and the weeds literally alive with snails, and for that reason the Department of Agriculture (N.S.W.) does not advise orchardists to cultivate at this stage, as the deprivation of natural food would cause the snails to migrate in even greater numbers to the citrus trees. Clean cultivation earlier in the season would have prevented the damage to a very large extent.

In dealing with the snail nuisance the removal of adjacent weed growth is absolutely essential prior to control measures being undertaken. However, it is again stressed that it is very exceptional for snails to attack fruit trees, and such attacks can be guarded against by clean cultivation, which means an absence of weeds.

Should the snails get ahead of the orchardist, one or other of the following measures for control can be recommended:—

While in a small area the snails may be collected by hand and destroyed, but when in a larger area and in large numbers the snails are best controlled by spraying or dusting, or by the use of poisoned baits. A poisoned bait consisting of 1 lb. calcium arsenate or Paris green and 16 lb. bran is recommended. It is essential that the Paris green should be thoroughly stirred dry with the bran until the whole is thoroughly mixed. Sufficient water is then added to make a damp crumbly mash. This bait is scattered in a thin layer on the soil along the rows of affected plants and other situations where the snails congregate. The bait should be applied late in the afternoon or at night to ensure its being moist, as it is useless in a dry condition. This bait proves effective, but may not kill the snails in appreciable numbers for two or three days.

Another method is to spray with arsenate of lead powder, 1½ lb. to 40 gallons of water, or arsenate of lead paste, 3 lb. to 40 gallons of water.

Mr. H. Fagan, of Lisarow, one of the growers whose trees were damaged by snails, obtained good results by using lead arsenate powder at the rate of 2 lb. to 50 gallons of water. Later he increased the strength to 3 lb. to 60 gallons, to which he added 6 lb. sugar, in the belief that the sugar would make the mixture more attractive. Results greatly favoured the mixture containing the sugar, and the Department of Agriculture is now investigating the value, if any, of sugar in stomach poison sprays for combating snails.

Dusting with 1 lb. arsenate of lead powder diluted with 4 lb. hydrated or slacked lime dust, finely sieved, can be recommended.

Boards set out at intervals and baited beneath with portions of boiled potato form attractive traps, where the snails will congregate and shelter by day, and can be destroyed in numbers.—"A. and P. Notes," N.S.W. Department of Agriculture.

Readers are reminded that a cross in the prescribed square on the first page of this "Journal" is an indication that their Subscription —one shilling—for the current year is now due. The "Journal" is free to farmers and the shilling is merely to cover the cost of postage for twelve months. If your copy is marked with a cross please renew your registration now. Fill in the order form on another page of this issue and mail it immediately, with postage stamps or postal note for one shilling, to the Under Secretary, Department of Agriculture and Stock, Brisbane.

Answers to Correspondents.

The subjoined replies are from a very large number posted from the Department to correspondents in the course of the month, and are selected because of their general interest. All inquiries should be addressed to the Under Secretary, Department of Agriculture and Stock, Brisbane.

Maize as Cattle Fodder.

R.B. (Eidsvold)—

Your inquiry if maize is a good thing to fatten bulls or bullocks was referred to the Agricultural Chemist, Mr. J. C. Brünnich, who advises:—Corn is undoubtedly the best fattening feed for cattle, but is rather low in protein, and therefore if the other feed does not contain a sufficient amount of protein, a loss will take place with waste of corn. It is best for fattening cattle to supplement the corn with legume hay in order to produce quick fattening. With very hard flinty grain, fed to horses, some may pass undigested, but this should never happen with cattle.

Soil Formation.

"Camara" (Barcaldine)—

The Agricultural Chemist, Mr. J. C. Brünnich, advises that soil is originally formed by the gradual crumbling up of rock by the action of weathering, induced by the alternate and combined action of air, rain, frost, and heat. Further changes take place by the processes of bacterial, plant, and animal life. Rocks are generally built up from a variety of minerals, which decompose in various ways, some forming soluble compounds, which are gradually washed out. Soils may remain in the place where they were formed or may be transported by wind and water. The same class of rock may produce various classes of soil according to locality and seasons. Most of the rocks contain only small amounts of phosphoric acid, and, therefore, many of our soils are deficient in phosphoric acid, which is of particular importance to produce nutritious pastures. Soils produced from granite rocks and sandstone are generally more deficient in phosphoric acid than soils formed from basaltic rocks.

Corn-Cob Meal.

Inquirer (Gayndah)—

The Agricultural Chemist, Mr. J. C. Brünnich, advises:—Although the feeding value of ground corn cobs is very small as compared with shelled corn, actual experiments with horses have proved that corn-cob meal is as valuable as an equal amount of shelled corn, because the corn-cob meal aids in the digestion and prevents waste of corn passing through undigested.

—	Digest Protein.	Digest Carbohydrates.	Digest Fibre.	Starch Value.
	Per Cent.	Per Cent.	Per Cent.	Per Cent.
Shelled corn contains ..	6·7	65·8	1·8	80·8
Corn-cob meal	0·5	26·8	18·3	23·1

To every 56 lb. of shelled corn give about 14 lb. of cob. According to variety of corn the weight of cob is from 20 to 40 per cent. of the grain, flint varieties having larger proportion of cob to grain than the dent corn.

Soil and Arsenate of Lead.

D.G.M. (Wellington Point)—

Your inquiry as to what effect, if any, the continuous application of arsenate of lead has on the soil, was referred to Mr. J. C. Brünnich, Agricultural Chemist, who advises:—Application of arsenate of lead will have no effect on the soil, as it is quite insoluble. There is no danger in handling the lead arsenate to persons; only actually eating and inhaling large amounts of the arsenate would be dangerous. Ordinary cleanliness, like washing hands before meals, needs to be observed by users.

BOTANY.

The following are selected from the heavy outward mail of Mr. C. T. White, F.L.S., Government Botanist:—

"Jack Bean."

W.M. (Nanango)—

The bean forwarded is *Canavalia ensiformis*, the Jack Bean. The beans can be used in the very young state as ordinary French beans, or the nearly ripe seeds cooked as Broad Beans or Lima Beans. As the beans do not apparently agree with all stomachs, it is as well to try them in a small way first. Personally we have eaten them a good deal and found then excellent, and trouble where reported has arisen we think through using the beans when too old and indigestible.

Khaki Weed.

W.R. (Kawl Kawl, Proston Line)—

The specimen is *Alternanthera Achyrantha*, the Khaki Weed. It is one of the worst weeds we have and should be eradicated immediately if possible when it makes its appearance in a district.

Suspected Poison Plant.

INQUIRER (Dalby)—

The specimen sent by Inspector McCarthy as suspected of poisoning a number of sheep at The Gums, Tara, is *Zygophyllum apiculatum*, a very common plant in Queensland but one for which I have not heard a local name. It is very drought-resistant and during very long droughts vivid green bushes of this plant are to be found in some places in great abundance. It is, however, rarely touched by stock. It has been suspected of causing losses, but, in the absence of feeding tests and chemical work, nothing very definite is known on this point.

Needle Burr, a Bad Pest.

INQUIRER (Kilkivan)—

Your specimen is not a hybrid between Cockscomb and Khaki Weed, but a natural species—viz., *Amarantus spinosus*, the Needle Burr. This plant is a very bad pest in some parts of North Queensland and we have seen occasional plants in the South. Finding a suitable environment, it is apt to become a bad pest but is nothing like so noxious as Khaki Weed.

"Gooseberry Cucumber" or "Paddy Melon."

H.P. (Ellinthorp)—

The specimens of fruits are those of *Cucumis myriocarpus*, the Gooseberry Cucumber or Paddy Melon. It contains the poisonous principle "myriocarpin." Stock eating it may become affected with partial blindness and paralysis. On the other hand, stock frequently eat large quantities without apparently any ill-effects following. In view of the possible danger it is as well to keep valuable stock off the plant.

Grasses Identified.

R.D. (Chinchilla)— Grasses have been identified as follows:—

1. *Aristida calycina.* A 3-pronged Spear Grass.
2. *Triraphis mollis.* Purple Heads.
3. *Trichol'aena Teneriffae.* Red Natal Grass.
4. *Andropogon refractus.* Barbed-wire Grass.
5. *Aristida vagans.* A 3-pronged Spear Grass.
6. *Andropogon pertusus.* Pitted Blue Grass.
7. *Chloris Gayana.* Rhodes Grass.
8. *Bromus unioloides.* Prairie Grass.
9. *Eleusine aegyptiaca.* Button Grass.
10. *Eragrostis Brownii.* Love Grass.
11. *Sporobolus indicus* var. *elongatus.* Rats' Tail Grass.
12. *Setaria glauca.* Pigeon Grass.
13. *Phalaris canariensis.* Canary Grass.
14. *Stipa micrantha.* Bamboo Grass.
15. *Pappophorum nigricans.* "White Heads."
16. *Heteropogon contortus.*
17. *Arundinella nepalensis.*
18. *Paspalum dilatatum.* Paspalum Grass.
19. *Panicum distachyum.*
20. *Panicum didactylum.* Blue Couch.
21. *Eragrostis Brownii* variety. Love Grass. A rather different form to No. 10. It is a variable grass with a number of different forms or varieties.
22. *Tragus racemosus.* Small Burr Grass.
23. *Chloris acicularis.* Star Grass.
24. *Perotis rara.* Comet Grass.
25. *Setaria aurea.* Pigeon Grass.
26. *Pollinia fulva.* Brown Top.
27. *Eriochloa punctata.*
28. *Fimbristylis diphylla.* A sedge; not a true grass. See note under No. 31.
29. *Fimbristylis barbata.* A sedge; not a true grass.
30. *Diplachne parviflora.*
31. *Cyperus rotundus.* Nut Grass. This is a sedge, not a true grass: the sedges are grass-like plants, for the most part growing in damp places; some are eaten by stock, but on the whole have not the nutritive value of the true grasses.
32. *Andropogon bombycinus.* Cotton Grass.
33. *Anthistiria ciliata.* Kangaroo Grass.
34. *Gahnia aspera.* A sedge; not a true grass.
35. *Panicum foliosum.* Leafy Panic Grass.
36. *Xerates leucocephala.* Not a grass, but a rather anomalous member of the Lily family.
37. *Panicum leucophæum.*
38. *Eriochloa punctata.* Same as 27.
39. *Panicum sanguinale.* Summer Grass.
40. *Chrysopogon parviflorus.* Scented Top.
41. *Panicum prolutum.* Coolah Grass.
42. *Panicum trachyrachis.* Coolibah Grass.
43. *Cyperus exaltatus.* A sedge.
44. *Chrysopogon gryllus.*
45. *Danthonia pallida.*
46. *Chloris virgata.*
47. *Pennisetum clandestinum.* Kikuyu Grass.
48. *Phragmites communis.* The Common Reed.
49. *Pennisetum purpureum.* Elephant Grass or Napier's Fodder.
50. *Panicum crus-galli.* Wild Millet.

"Potato Bush."

INQUIRER (Brisbane)—

The specimen from the farm at Purga, *viâ* Ipswich, is *Solanum elliptieum*, a species of "Potato Bush." This plant has several times been suspected of causing losses among sheep though nothing definite has been proved against it. The green berries of most of these plants, however, are dangerous, as most of them contain varying quantities of the poisonous alkaloid—solamine.

The Woods of Albizzia and Pithecolobium.

INQUIRER (Brisbane)—

There seems no doubt that the leaves are correctly matched with the wood specimens of the Yellow Siris. They seem to represent a species of Pithecolobium rather than Albizzia but cannot be matched with any of our material, and they probably represent an undescribed species. We would therefore be glad of complete specimens when available. The woods of species of Albizzia, Pithecolobium, and Archidendron are probably very similar. Baron Mueller classed all these plants under one genus Albizzia, but in this he is not followed by most botanists.

Sandalwood.

E.W.B. (Woepen, *via* Cairns)—

The fruits arrived in a very mouldy condition, but we think the specimens represent the Sandalwood (sometimes called Plum-tree Sandalwood)—*Santalum lanceolatum*. It is recorded that the natives eat the fruits, but beyond that we have no knowledge of their edibility. The wood varies a good deal in its scent. The wood of all the Southern trees is quite scentless, but the wood of most of the Northern trees is more or less scented—particularly of the trees round the Gulf and in the Cape York Peninsula. In sending specimens it is always best to dry them flat between sheets of paper for a few days first; they travel better dry than fresh from any distance.

A Pernicious Weed—Other Weeds.

J.A.B. (Amamoor)—The specimens sent proved to be—

1. *Tridax procumbens*. A native of Tropical America. It has been naturalised in North Queensland for some time, and of late has spread to the South. It is a most pernicious weed and should be destroyed wherever it puts in an appearance. We do not know a local name.
2. *Gnaphalium purpureum*. Cud Weed.
3. *Ageratum conyzoides*. This was introduced as a garden plant and forms of it are grown in Southern gardens. In Queensland it has become a common weed and is popularly known as "Billy Goat Weed"; "Blue Top" is also given to it, but this is applied to a number of plants with blue flowers.
4. *Galinsoga parviflora*. Yellow Weed.
5. *Chenopodium carinatum*. A very common weed of cultivation in Queensland. We have not heard a local name for it.
6. *Stellaria media*. Chick Weed.
7. *Richardsonia scabra*. Mexican Clover. This plant has been spoken highly of in America as a fodder, but our experience with it here is simply as a bad weed of cultivation. We have not noticed stock eat it at all, but have once or twice received specimens with the report that stock eat it greedily. It is not, of course, a true clover.
8. *Euphorbia pilulifera*. Asthma Plant. The dried herb used as a tea gives relief to persons suffering with asthma.

ROSE CULTURE.

In regard to the questions raised—

1. What is the best time to prune roses? We should say now.
2. What is the best time to strike cuttings? This can be done from now on during the cooler weather. On the whole it pays, however, to get worked plants, as we do not think the majority of roses do too well in Queensland on their own roots.

PAPAWS.

3. Is there any way you can tell male papaw plants from the females in the young stage? A method we have found fairly satisfactorily is to discard the more robust plants and plant out the smaller ones.

HOYA.

4. Can hoya roots be struck in the ground? Hoya strikes fairly readily in light soil; plants rooted in the ground readily climb up bush-house posts or wherever you wish to grow them.

BORONIA.

5. *Boronia megastigma* and *B. serrulata.*—These as a rule do not do too well in Queensland, the hot wet summer is against them; we think you would have to get plants or seeds from one of the Southern nurserymen. They are not, as a general rule, propagated here.

6. *Thunbergias, Lasiandras,* and *Lagerstroemia* are usually propagated by cuttings of fairly well ripened wood in the spring.

"Mexican Clover."

INQUIRER (Meringa)—The specimens proved to be:—

No. 1. *Richardsonia scabra,* sometimes called "Mexican Clover." It is a native of tropical and subtropical America, but now occurs as a naturalised weed in many countries. In Queensland it is a very common weed along the whole of the coastal belt. In the United States it has been highly spoken of as a fodder, but out experience here is that stock rarely touch it, at least to any extent. It belongs to the family Rubiaceae and is, of course, not a true clover.

No. 2. *Eclipta alba.* Family Compositae.

"Stork's Bill" or "Crow's Foot."

H.C. (Thangool)—

The specimen forwarded is *Erodium cygnorum* or "Stork's Bill," a member of the Geraniaceæ or Geranium family. It is commonly known in many places as "Crowfoot" and is regarded as one of the best of the fodders in herbage country, affording good feed during the winter and spring months. The ripe seeds with their corkscrew-like tails are regarded as somewhat obnoxious in sheep country, but its good qualities outweigh its bad. The plant cut in flower is said to make good hay. In some parts of Southern Queensland and Western New South Wales the plant occurs in great abundance.

FRUIT CULTURE.

Apples in Central Queensland.

J.A. (Yalleroi, C.Q.)—

The Acting Director of Fruit Culture, Mr. Geo. Williams, advises:—The climate of Central Queensland is not adapted for the successful culture of apples. Limited crops only could be obtained, and Hockings' Greening and Carrington would be expected to give best results.

SHEEP AND WOOL.

Selected replies by the Instructor in Sheep and Wool, Mr. W. G. Brown.

Blight in Sheep.

M.E.G. (Roma)—

In regard to your correspondent's question concerning blight in sheep, I have to advise that there are several troubles with sheep's eyes.

1st, Grass Seed: In this case the wool should be clipped around the eyes, and a little castor oil applied.

2nd, Dietary: There are often weeds such a paddy melon vine which causes temporary blindness. The sheep will recover after being taken off the country where paddy melon grows within a fortnight.

3rd: Sometimes ewes heavy in lamb, if disturbed by dogs, &c., have the lambs crossed. A notable symptom of this class of blindness is shown by the animal holding its head in the air, and they are weak across the hindquarters.

4th: There is real blight. This can only be dealt with by the application to the eyes of a solution containing sulphate of zinc—2 parts water, 5 parts sulphate of zinc.

I would be glad to know which of the above causes are operating on your correspondent's sheep. We can advise better then.

Blight in Sheep.

M.E.G. (Roma)—

I note that your correspondent's sheep are suffering from real blight. I consulted Mr. A. H. Cory, M.R.C.V.S., Chief Inspector of Stock, and he advises that the following formula will give relief:—Sulphate of zinc, 20 grains; water, 6 fluid ounces; to be applied with glass syringe once a day.

PIG RAISING.

Selected replies by the Instructor in Pig Raising, Mr. E. J. Shelton.

Pig Feeding.

W.H.F. (Leyburn)—

A ration of sorghum, maize, and lucerne together with some concentrate such as pollard, barley meal, or protein meal, &c., should prove quite satisfactory, with the addition of mineral matter and a good supply of clean drinking water. Under our conditions and our market requirements, we find that to do away with concentrates and mash feedings does not pay, and, in addition to grazing on sorghum, we would suggest that you crush the maize, boil or soak it, and mix it, with some concentrate, into a gruel and feed warm as a morning food; green lucerne and whole maize could be fed for the afternoon food. Charcoal and a piece of rock salt should always be available in the yards or pens so as the pigs have access to it at all times; we do not advise grinding and mixing charcoal with the food. The addition of lime water to the morning food will be found to have very beneficial results. To make lime water, secure a wooden cask, place about half a bucket of lime in the bottom and fill with water; after using each morning refill the cask with water, and so long as a film appears on the surface each morning the lime is still acting; feed in the proportion of about one pint to kerosene tin of feed.

Broom Millet Seed as Pig Feed.

G.F.C. (Dallarnil)—

On looking up the chemical analysis of both maize and broom millet, it is found that there is very little difference between these two grains. Maize contains 9.5 per cent. protein, 69.3 per cent. carbohydrates, and 4 per cent. fat; while broom millet contains 12.6 per cent. protein, 60.8 per cent. carbohydrates, and 4.8 per cent. fat. Maize, of course, can be fed as a dry grain; in fact we recommend this way of feeding maize. While it will not be found to advantage to feed millet other than by boiling or crushing it and mixing with skim milk and pollard or some other concentrate, still it may pay to experiment by feeding, say, three pigs with a mixture of maize and millet boiled and fed with skim milk; three pigs with millet boiled and fed with skim milk; and three pigs with maize alone. Plus green feed and minerals in each case. Should you conduct this experiment we would be pleased to receive any information and results you obtain; but from our present experience of millet grain we would not recommend feeding it other than as stated.

Molasses as Pig Feed.

F.B. (Cooran)—

When molasses is fed to pigs it should only be used as an appetiser and laxative, but if fed in excess may result in the death of the animals. From the information supplied to us we do not consider that the death of your pigs, in the saleyards or truck, was caused by the feeding of molasses, but rather as a result of an overloaded stomach caused by feeding the pigs immediately before they were trucked. This practice has been the cause of death in many cases and is not to be recommended at any time.

General Notes.

Banana Beetle Borer—Control Reward Offered.

Under the Fruit Marketing Organisation Act, Regulation No. 127 was published in the "Government Gazette" of the 23rd April last, authorising the Committee of Direction to offer a reward of £2,500 for an effective scheme of treatment for the control of the Banana Weevil Borer on certain term and conditions. By a further Regulation, No. 131, the reward of £2,500 has been increased to £5,000.

Egg Board Levy.

Regulations have been approved under "The Primary Producers' Organisation and Marketing Act of 1926," providing for the collection of a levy by the Egg Board, at the rate of one-half penny per dozen eggs, delivered to that Board from the 1st July, 1927, to the 31st December, 1928.

An Order in Council has also been approved empowering the Egg Board to give the security to the Commonwealth Bank necessary for financial assistance being given to the Egg Board by that bank.

"Stock Foods and Feeding."

Writing for another copy of Mr. Brünnich's "Stock Foods and Feeding," a Mount Larcom farmer says:—"I had one and it was a very useful book indeed. I consider the information and the tables of food values made that book worth easily ten shillings to anyone who is trying to get the best results from his stock. . . . . I was telling a Jersey stud breeder of this book and as he was preparing his cattle for the show he requested the loan of my copy. . . . I am without that copy too long already so will be much obliged if you would forward another. . ."

Better Farming—Wheat on Downs—Storage of Fodder.

The big improvement in cultural operations in wheat-growing, which has taken place in recent years, very forcibly struck the Instructor in Agriculture in the Southern Division (Mr. A. E. Gibson) on his recent visit to the Darling Downs. On his return Mr. Gibson said that wheat areas were now receiving a measure of careful treatment that must reflect later on in heavier crops, and in the improved condition of the occupiers of those areas. Horses were now being replaced by tractors and other up-to-date machinery. Provision was being made by means of hay-stacks, which in some instances were thatched, as an insurance against periods of lessened production. Not alone in these, but in other directions, was the improvement in methods noticeable throughout the Downs. The improvements, no doubt, were a consequence of experience gained, and of teaching absorbed, over the last ten years, part of which was a drought period. Improvements in farm buildings were also noticeable.

Fodder Storage Practice.

Where forage crops are used for hay, as they frequently are, it is also important to see to it that the hay is well cured before drawing into the barn. If proper curing takes place in the field—where possible, by use of cocks, in which "sweating" takes place—and if every reasonable precaution is taken to ensure the drawing in of hay adequately dried, there is little danger of fire from spontaneous combustion.

Clovers and lucerne, or mixtures containing these, call for special care in this respect, owing to the greater difficulty in drying out sufficiently these crops. Moreover, making hay from these crops by use of cocks preserves the leaf, in which portion of the crop exists 80 per cent. of the protein.

Having gone to the expense and trouble he has in the raising of forage crops, it behoves the farmer to not jeopardise his good efforts by carelessness in curing and storing the hay produced from valuable forage crops.

Too much care in the field cannot be taken, particularly to-day when more legume hay (clovers and lucerne) is produced and when the hay is rushed in from the windrow with the hay-loader—an excellent labour-saving implement, but one which should not be misused by using it to rush in hay of doubtful fitness or of excessive moisture-content to justify storage.

Staff Changes and Appointments.

The following have been appointed Assistants to Cane Testers for the forthcoming sugar season, at the mills set opposite:—Miss S. Riley, Tully; Miss F. Foubister, Proserpine; Miss E. Walsh, Plane Creek; Mr. G. Becker, Marian; Mr. W. J. Mason, Pleystowe; Mr. H. T. Whitcher, Maryborough; Mr. T. P. Brown, Proserpine; Miss E. Brand, Bingera.

The resignation of Mr. D. P. Cox as Inspector of Stock, Urandangie, has been accepted as from the 14th June, 1927, as tendered.

Messrs. C. J. Boast, J. McFie, and R. J. Rollston have been appointed Assistant Inspectors of Cane Testers for the forthcoming sugar season.

Mr. H. Niemeyer has been appointed Chairman of the Broom Millet Board.

Mr. E. J. R. Barke has been appointed Chemist in Charge of the Sugar Experiment Station, South Johnstone.

Downs Wheat Crop—Prospects Encouraging.

The Director of Agriculture (Mr. H. C. Quodling), when asked recently for an opinion on the effect of the recent rainfall on the prospective wheat crop, stated that Mr. C. S. Clydesdale (Assistant Instructor in Agriculture) had just returned from a fortnight's visit to the Darling Downs and South-Western Line, made in connection with the seed wheat improvement work which the Department had in hand. As the visit covered a wide extent of the wheat belt, it was pleasing to record the fact that Mr. Clydesdale was very well satisfied indeed with his observations respecting the prospects of the present crop, which, with a second fall of rain within the last fortnight, had been favoured with just what was required to carry on the young plants resulting from the germination promoted by the first fall. Moreover, there was evidence everywhere that the land sown to wheat was in first-class condition, due largely to the early preparation by summer fallowing of the seed bed and the use of up-to-date tractor plants. The area also was fully equal to, if not greater than, that ordinarily sown each season with wheat. Taking all things into consideration, the present season's prospects were most encouraging.

State Government Insurance Office—Another Record Bonus Year.

The Acting Treasurer (Mr. J. Mullan) to-day (8th June) drew attention to the preliminary report of the Actuary (Mr. T. W. Bremner, F.F.A., A.I.A.) regarding the funds of the Life Department of the State Government Insurance Office to 31st December, 1926.

Mr. Mullan stated that the Insurance Commissioner has received preliminary advice from the Actuary (Mr. T. W. Bremner, F.F.A., A.I.A.) who is now in Brisbane, that after providing reserves for all policy contracts there is a surplus of assets over liabilities sufficient to provide a reversionary bonus for year ended 31st December, 1926, of £2 5s. per £100 assured on participating Whole Life Policies and of £1 10s. per £100 on endowment assurances and endowments. This bonus the Actuary has recommended. The Minister was pleased also to draw attention to the state of the funds, which now total £1,082,275.

The fact that the Office could easily say that every year is a bonus year, and that this is a record year, is striking evidence of the great strides it has made during the nine years it has been in operation.

Wheatgrowing Competition.

The Power Farming Cup, which was competed for by wheatgrowers throughout Australia, was, this year, won by Mr. S. Reilly, junr., of "Karimbla," Cumnock, New South Wales.

The cup was given for the best crop of wheat put in and taken off by a farm tractor, the crop being judged on the following scale of points:—

Yield: One point for every bushel yield per acre, 50. Bushel weight: One-half point for every ¼ lb. above 60 lb., 15. Appearance and uniformity, 15. Trueness to type, 10. Freedom from disease, pests, and foreign odours, 10. Total, 100.

Mr. Reilly, the winner, secured 37 points for yield, 11½ points for bushel weight, and the maximum for appearance and uniformity, trueness to type, and freedom from disease, giving a total of 83½ points. Such a result indicates the high standard of farming that can be attained by tractor farmers.

One of the biggest advantages of the use of tractors in wheatgrowing is that the various operations can be rapidly completed when conditions are such that the best possible results can be obtained.

Starting a Cold Engine.

At this time of the year many motorists experience great difficulty in starting their engines. A cold engine requires a richer mixture, both for starting and running, than a warm or hot one; moreover, an engine heats more rapidly with such a mixture. Hence it is necessary in starting a cold engine to close the carburetter choke a distance proportionate to the degree of cold. Moderately low temperatures require that the choke be closed only part way, and lower temperatures are met by completely closing it. This latter position, however, must be most judiciously used, because then practically all the carburetter air supply is shut off; the choke, therefore, should be slightly opened after the engine has been cranked a few revolutions to obviate the possibility of too rich a mixture, which would prevent ready starting. It is best when starting in very low temperatures alternately to close and then half open the choke while the engine is being cranked, thus preventing the accumulation of vaporised fuel in the inlet manifold and cylinders. As soon as the engine has started the choke should be opened, though not far enough to cause back-firing or materially to reduce the engine's speed. Opening the choke all the way produces a lean mixture and may cause the engine, if cold, to stop running, or, at best, to run with but little power. It, therefore, should remain slightly closed and the engine run until well heated and operating smoothly and quietly, when it should be opened fully.

The Royal Society of Queensland.

The ordinary monthly meeting of the society was held in the Geology Lecture Theatre on 30th May. The President, Professor E. J. Goddard, was in the chair.

Mr. Geo. Preston was unanimously elected as a member.

J. R. A. McMillan, Esq., M.Sc., was nominated for ordinary membership.

In the absence of the author, Mr. C. T. White communicated a paper by Mr. W. D. Francis on the "Anatomy of the Australian Bush Nut (*Macadamia ternifolia*)." In addition to the structural features the author outlined the composition of parts of the nut as revealed by micro-chemical tests. A comparative description of the fruits of the other species of the genus was also given. The paper was illustrated by text-figures and photo-micrographs. A discussion took place in which Messrs. Gurney, White, Bick, and the President took part.

Mr. C. T. White also communicated Dr. B. H. Danser's "Revision of the Queensland Species of *Polygonum*." This revision shows that up to the present fifteen species of *Polygonum* have been collected in Queensland. Four of these are recorded for the first time in Australia. On the other hand three species—*P. lanigerum* R. Br., *P. subsessile* R. Br., and *P. articulatum* R. Br.—recorded previously as distinct species, are now united with the others.

Mr. H. A. Longman and the President commented on the paper.

Stallions Registration Act.

By a proclamation issued under the Stallions Registration Act, it has been approved that that Act shall be in force in the under-mentioned districts:—

Southern District.—That portion of Queensland south of the 25th parallel of south latitude and east of the 146th meridian of longitude, and including the Petty Sessions District of Bundaberg.

Central District.—That portion of Queensland south of the 21st parallel of south latitude north of the 25th parallel of south latitude and east of the 144th meridian of longitude, but excluding the Petty Sessions District of Bundaberg.

The Boards have been appointed for these districts and will comprise the following members:—

Southern District Stallion Board.

John Legg, M.R.C.V.S., B.V.Sc.,
Ernest Baynes,
Patrick Short, and
James Sprott.

Central District Stallion Board.

John Arthur Rudd, L.V.Sc.,
James Arthur, and
Ramsden Gledstanes Talbot.

Advertising Queensland.

In the course of a recent public address, Mr. H. W. Mobsby, F.R.G.S., artist and photographer of the Department of Agriculture and Stock, gave an informative account of efforts to advertise Queensland effectively at the several National Exhibitions at which he has acted abroad as a representative of this State.

Mr. Mobsby took his audience in picture and description from the typical farmer at the plough representing the "man on the land," who he explained was at the point where the progress of the State began and on whose success many industries depended. Following on, Mr. Mobsby projected on the screen pictures of the many primary industries, also a portrait of the Minister (Mr. W. Forgan Smith), and explained the activities of the Department over which he presided and that watched and safeguarded the farmers' interests in the way of general guidance and practical field assistance, acting, as it were, as schoolmaster and policeman. Mr. Mobsby described vividly for the benefit of the younger people present the pictures he showed of the industries in several parts of the State, and emphasised the need of parents buying Queensland products in the form of manufactured goods, and asked his hearers to always ask for Queensland manufactures for their daily requirements. The greater the demand, he said, the greater the production; thus Queensland would keep pace with other States and countries in her secondary industries and build up the home market, which was the farmer's most profitable outlet. He then took his audience overseas on an imaginary tour, with vivid descriptions, to the Franco-British Exhibition, London, 1908, the Panama-Pacific Exposition, San Francisco, U.S.A., 1915, the British Empire Exhibition, Wembley, England, 1924, and the New Zealand and South Seas Exhibition, Dunedin, N.Z., 1925-26. At each exhibition Mr. Mobsby was Queensland's representative and arranged comprehensive displays of our products, so advertising Queensland generally, together with providing a fund of information to the thousands of visitors at each place. Many fine pictures were associated with each place en route when Queensland's products were shown.

In conclusion, Mr. Mobsby threw on the screen many fine pictures he secured during the recent visit of the Duke and Duchess of York to Queensland, which brought to a close a very educational and instructive evening.

Prolonging the Life of a Car.

Judging by the great number of new cars being sold in the country every month there must be many new owner-drivers making their first acquaintance with the control and management of cars. There are many minor points in running in a car, which, if given attention as occasion demands, will have a material effect in prolonging the life of the car and in reducing the amount of the owner's yearly maintenance bill.

On the way a car is treated during the first few months of running largely depends the measure of its reliability and the length of its life. In no circumstances should a new engine be over-speeded, and it is important to remember that this is a matter of piston speed rather than of car speed. Owners, particularly of the cheaper models, which manufacturers cannot afford to run-in properly before delivery, are advised by the makers not to drive more than twenty to twenty-five miles an hour during the first 500 miles run. The wise man will adhere strictly to this injunction. He will be still wiser if he bears in mind the fact that the principle applies equally to speed on the lower gears. It is useless to keep down to twenty miles an hour on top, if a tight engine is run up to fifteen or sixteen miles frequently on second speed.

Moreover, much patience and care will be wasted if, after the first 500 miles, the maximum is not raised progressively. Most chassis, even of the expensive type, are better driven with a good reserve at all times during the first 1,000 to 1,500 miles. A point applicable throughout an engine's life, which bears materially upon durability, is that of starting and running an engine from cold. The best and most economical method to adopt for battery as well as engine life is to crank the engine two or three times by hand before switching on. It should then be run slowly until it is warmed before any serious load is put upon it. Never race a cold engine, and, if it can be avoided, never drive off the car until the oil has warmed and is circulating freely.

The life of all machinery is dependent, not only upon the quantity of lubricant supplied as a cushioner or insulator, but also upon the quality. Oil loses its vitality with use. Thus, it is important and economical to clean the back axle, gear-box, and especially the engine from time to time, and to replenish them with fresh oil. The power developed by an engine is dependent largely upon the correct setting of the sparking-plug points and the tappets. For this reason clearances should not be neglected, but should be examined and corrected periodically. Do not neglect the maker's instructions as to chassis lubrication. The road wheel bearings—parts that are generally forgotten—should receive due attention.

Farm and Garden Notes for August.

Land which has been lying fallow in readiness for early spring sowing should now be receiving its final cultivation prior to seeding operations. Potato-planting will be in full swing this month, and in connection with this crop the prevention of fungoid diseases calls for special attention. Seed potatoes, if possible, should be selected from localities which are free from disease; they should be well sprouted, and, if possible, should not exceed 2 oz. in weight. Seed potatoes of this size are more economical to use than those large enough to necessitate cutting. If, however, none but large-sized seed are procurable, the tubers should be cut so that at least two well-developed eyes are left. The cut surfaces require to be well dusted with slacked lime, or wood ashes, as soon as possible after cutting. Where it is necessary to take action to prevent possible infection by fungoid disease, the dipping of potatoes in a solution of 1 pint of 40 per cent. formalin to 15 gallons of water, and immersing for one hour, will be found effective. Bags intended for the subsequent conveyance of tubers to the paddock should also be treated and thoroughly dried. After dipping, spread out the potatoes and thoroughly dry them before re-bagging. Where the tubers are cut, the dipping is, of course, carried out prior to cutting.

Arrowroot, yams, ginger, and sugar-cane may be planted this month in localities where all danger from frosts is over.

Maize may be sown as a catch crop, providing, of course, that sufficient soil moisture is available.

Sweet-potato cuttings may also be planted out towards the end of the month.

Weeds will now begin to assert themselves with the advent of warmer weather; consequently cultivators and harrows should be kept going to keep down weed growths in growing crops and on land lying fallow, as well as on that in course of preparation for such crops as sorghums, millets, or panicums, maize, and summer-growing crops generally.

Tobacco seed may be sown on previously burnt and well prepared seed-beds.

KITCHEN GARDEN.—Nearly all spring and summer crops can now be planted. Here is a list of seeds and roots to be sown which will keep the market gardeners busy for some time: Carrots, parsnips, turnip, beet, lettuce, endive, salsify, radish, rhubarb, asparagus, Jerusalem artichoke, French beans, runner beans of all kinds, peas, parsley, tomato, egg-plant, sea-kale, cucumber, melon, pumpkin, globe artichokes. Set out any cabbage plants and kohl-rabi that are ready. Towards the end of the month plant out tomatoes, melons, cucumbers, &c., which have been raised under cover. Support peas by sticks or wire-netting. Pinch off the tops of broad beans as they come into flower to make the beans set. Plough or dig up old cauliflower and cabbage beds, and let them lie in the rough for a month before replanting, so that the soil may get the benefit of the sun and air. Top dressing, where vegetables have been planted out, with fine stable manure has a most beneficial effect on their growth, as it furnishes a mulch as well as supplies of plant food.

FLOWER GARDEN.—All the roses should have been pruned some time ago, but do not forget to look over them occasionally, and encourage them in the way they should go by rubbing off any shoots which tend to grow towards the centre. Where there is a fine young shoot growing in the right direction, cut off the old parent branch which it will replace. If this work is done gradually it will save a great deal of hacking and sawing when next pruning season arrives. Trim and repair the lawns. Plant out antirrhinums (snapdragons), pansies, hollyhocks, verbenas, petunias, &c. Sow zinnias, amaranthus, balsam, chrysanthemum, marigolds, cosmos, coxcombs, phloxes, sweet peas, lupins; and plant gladiolus, tuberoses, amaryllis, pancratium, ismene, crinums, belladonna, lily, and other bulbs. In the case of dahlias, however, it will be better to place them in some warm, moist spot, where they will start gently and be ready to plant out in a month or two. It must be remembered that this is the driest of our months. During thirty-eight years the average number of rainy days in August was seven, and the mean average rainfall 2.63 in., and for September 2.07 in., increasing gradually to a rainfall of 7.69 in., in February.

Orchard Notes for August.

THE COASTAL DISTRICTS.

The remarks that have appeared in these notes from time to time respecting the handling and marketing of citrus fruits apply equally to the present month. The bulk of the fruit, with the exception of the latest ripening varieties in the latest districts, is now fully ripe, and should be marketed as soon as possible, so that the orchards can be got into thorough order for the Spring growth. All heavy pruning should be completed previous to the rise in the sap; and where Winter spraying is required, and has not yet been carried out, no time should be lost in giving the trunks, main branches, and inside of the trees generally a thorough dressing with lime and sulphur wash.

Where citrus trees are showing signs of failing, such as large quantities of dead or badly diseased wood in the head of the tree, they can (provided the root system is healthy) be renovated by cutting back the entire top of the tree till nothing but sound healthy wood is left. This should be thinned out, only sufficient main limbs being left from which to form a well-balanced tree, and the trunk and limbs so left should receive a dressing of lime sulphur, or Bordeaux paste.

Healthy trees that are only producing inferior fruit should be treated in a similar manner, and be either grafted with an approved variety direct or be allowed to throw out new growth, which can be budded in due course. The latter method is to be preferred, and an inferior and unprofitable tree can thus be converted in the course of a couple of years into a profitable tree, producing good fruit.

Where orchards have not already been so treated, they should now be ploughed so as to break up the crust that has been formed on the surface during the gathering of the crop, and to bury all weeds and trash. When ploughed, do not let the soil remain in a rough, lumpy condition, but get it into a fine tilth, so that it is in a good condition to retain moisture for the tree's use during Spring. This is a very important matter, as Spring is our most trying time, and the failure to conserve moisture then means a failure in the fruit crop, to a greater or lesser extent.

Do not be afraid if you cut a number of surface roots when ploughing the orchard, but see that you do cut them, not tear them. Use a disc plough and keep the discs sharp, and the root-pruning the trees will thus receive will do more good than harm, as it will tend to get rid of purely surface roots.

Planting of all kinds of fruit trees can be continued, though the earlier in the month it is completed the better, as it is somewhat late in the season for this work. The preparation of land intended to be planted with pineapples or bananas should be attended to, and I can only reiterate the advice given on many occasions—viz., to spare no expense in preparing the land properly for these crops—as the returns that will be obtained when they come into bearing will handsomely repay the extra initial expense. Growers of pineapples and bananas who send their fruit to the Southern markets should take more care in the grading and packing of such fruit, as their neglect to place it on the market properly means a big difference in price, and entails a loss that could be avoided had the necessary care and attention been given. The same remarks apply to the marketing of citrus fruits, papaws, custard apples, strawberries, cucumbers, and tomatoes, all of which are in season during the month.

The pruning of all grape vines should be completed, and new plantings can be made towards the end of the month. Obtain well-matured, healthy cuttings, and plant them in well and deeply worked land, leaving the top bud level with the surface of the ground, instead of leaving 6 or 7 in. of the cutting out of the ground to dry out, as is often done. You want only one strong shoot from your cutting, and from this one shoot you can make any shaped vine required. The spraying of vines for downy mildew is not compulsory, but an application eliminates black spot.

Fruit-fly will make its appearance during the month, and citrus and other fruits are likely to be attacked. Every grower should, therefore, do his best to destroy as many flies as possible, both mature insects and larvæ, the former by trapping or otherwise, and the latter by gathering and destroying all infested fruit. If this work is carried out property, a large number of flies that would otherwise breed out will be destroyed, and the rapid increase of the pest be materially lessened. The destruction of fruit-flies early in the season is the surest way of checking this serious pest.

Keep a careful lookout for orange-sucking bugs, and destroy every mature or immature insect or egg that is seen. If this work is done thoroughly by all citrus growers there will be far fewer bugs to deal with later on, and the damage caused by this pest will be materially reduced. Destroy all elephant beetles seen on young citrus trees, and see that the stems and main forks of the trees are planted with a strong solution of lime sulphur.

THE GRANITE BELT, SOUTHERN AND CENTRAL TABLELANDS.

The pruning of all deciduous trees should be finished during the month, and all such trees should be given their annual winter spraying with lime sulphur. The planting of new orchards should, if possible, be completed, as it is not advisable to delay. Later planting can be done in the Granite Belt, but even there earlier planting is to be preferred.

Peach trees, the tops of which have outlived their usefulness and of which the roots are still sound, should be cut hard back so as to produce a new top which will yield a good crop of good fruit the following season in from fifteen to eighteen months, according to the variety.

Apple, pear or plum trees that it is desirable to work over with more suitable varieties should also be cut hard back and grafted. All almond, peach, nectarine, and Japanese plum trees should be carefully examined for black peach aphis, as, if the insects which have survived the winter are systematically destroyed, the damage that usually takes place from the ravages of this pest later on will be materially lessened.

Woolly aphis should also be systematically fought wherever present. The best all-round remedy for these two pests is spraying with black leaf 40.

In the Granite Belt the pruning of vines should, however, be delayed to as late in the season as possible, so as to keep the growth back and thus endeavour to escape late Spring pests.

Where orchards and vineyards have been pruned and sprayed, the land should be ploughed and brought into a state of as nearly perfect tilth as possible, so as to retain the moisture necessary for the proper development of the trees or vines and the setting of their fruit.

PLUMBING JOBS ON THE FARM.

There are many little jobs required to be done on the farm which can be successfully accomplished by the occupier. For example, there is soldering. At a recent meeting of the Mount Hope branch of the South Australian Agricultural Bureau, Mr. H. Myers said a little knowledge of soldering would enable the farmer to do many jobs without delay and without the expense of engaging a tradesman. A good set of soldering tools, including an iron, spirits of salts for cleaning the material, and a piece of sal ammoniac, were necessary for the work. The soldering iron should be clean and well tinned to ensure a good job. The iron should be heated and the point filed to give a bright surface, when it should be dipped in the spirits of salts to which had been added a piece of tin. The iron should be rubbed on the sal ammoniac with solder until it was well tinned. Care should be taken to see that the iron was not overheated after being tinned, otherwise the job would have to be done again. It was most important to see that the work to be done was thoroughly clean, otherwise the solder would not take. To do that, the article should be scraped clean, then brightened with emery or sandpaper, and finally cleaned with spirits of salts. Care should be taken when using the spirits to see that it did not come in contact with other than the part to be soldered. If it was allowed to reach other parts that were not being soldered it would eat away the metal. In discussing the paper, Mr. R. L. Myers said after scraping and cleaning the metal to be soldered it was advisable to rub it with damp copper sulphate crystal, when a coppery surface would be obtained. Mr. W. F. Vigar gave the following method of tinning the iron:—Dissolve a quantity of sal ammoniac in a pint of water, and have a piece of flat iron or a similar substance handy, as well as some muriatic acid and solder. Bring the iron to a dull red heat, plunge it into the sal ammoniac solution for a second or two, then plunge into the acid which has been spread over the iron. Melt a few drops of solder on to the iron and rub the bit in it until thoroughly tinned. The honorary secretary (Mr. A. T. Vigar) said if one had much soldering to do, a copper bar should be purchased, and bits made therefrom. A flux which he had found very useful was prepared as follows:—Dissolve as much zinc as possible in acid, and afterwards dissolve sal ammoniac in zinc chloride.

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S., AND A. C. EGLINTON.

TIMES OF SUNRISE, SUNSET, AND MOONRISE.

AT WARWICK.

1927.	JULY.		AUGUST.		MOONRISE.	
					July.	Aug.
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Rises.
					a.m.	a.m.
1	6.46	5.6	6.36	5.20	8.15	8.53
2	6.46	5.6	6.35	5.21	9.4	9.25
3	6.46	5.6	6.34	5.22	9.45	9.54
4	6.46	5 6	6.34	5.22	10 21	10 24
5	6 46	5.6	6 33	5 23	10.54	10.56
6	6.46	5.7	6.33	5.23	11.25	11.28
						p.m.
7	6.46	5.7	6.32	5 23	11.55	12 4
					p.m.	
8	6.46	5.8	6.31	5 24	12 25	12.43
9	6.45	5.8	6.31	5.24	12 56	1.30
10	6.45	5.9	6.30	5 24	1 30	2 22
11	6.45	5.10	6 29	5.25	2.9	3 21
12	6.44	5.11	6.28	5 26	2 52	4.23
13	6.44	5.12	6.27	5.27	3.41	5 30
14	6.44	5.12	6.26	5.28	4 37	6.37
15	6 44	5.12	6.25	5.29	5.37	7.43
16	6 43	5.12	6.25	5.29	6 41	8.48
17	6 43	5.13	6.24	5·30	7.47	9.52
18	6 43	5.13	6.23	5.30	8.47	10.56
19	6 43	5.13	6 22	5.31	9.55	12 0
20	6.43	5 13	6.21	5.31	10.57	...
						a.m.
21	6.42	5.14	6.21	5.31	12 0	1.4
22	6.42	5 14	6.20	5.32	...	2.6
					a.m.	
23	6.42	5.15	6.20	5.32	1.2	3.5
24	6.41	5.15	6.19	5.32	2.6	4.1
25	6.41	5.16	6.18	5.32	3.10	4.52
26	6.40	5.17	6.16	5.33	4.12	5.37
27	6.40	5 17	6.14	5.33	5·11	6.16
28	6.39	5.18	6.13	5·34	6.6	6 52
29	6.38	5.18	6.11	5.34	6.58	7.24
30	6.37	5.19	6.10	5.35	7.39	7.58
31	6.37	5.20	6.9	5.35	8.18	8.25

Phases of the Moon, Occultations, &c.

The times stated are for Queensland, New South Wales, Victoria, and Tasmania.

7	July	☾	First Quarter	10 52 a.m.
15	,,	○	Full Moon	5 22 a.m.
22	,,	☽	Last Quarter	12 43 a.m.
29	,,	●	New Moon	3 36 a.m.

Apogee 7th July, at 9 54 a.m.
Perigee 19th July, at 10 24 p.m.

About 6 p.m. or a little before, on 1st July, Mercury will be in a favourable position to be recognised on account of its nearness to the young crescent Moon. Both will be low down towards the western horizon, Mercury being about eight times the diameter of the Moon to the left. Mars will be about 15 degrees above the Moon, and Venus, the most brilliant planet, at a still greater height, being practically at its greatest elongation eastward from the Sun.

It will be interesting to watch the nearer approach of Mars and Venus on the following evening. Conjunction with these two planets will take place, but at times when they will not be visible here.

The earth will be at its greatest distance from the Sun on the 3rd, but not on that account is the season coldest. The temperature depends upon the Sun's declination far north, the shorter hours of sunlight, and the direction of the winds which may happen to prevail.

The two biggest planets, Jupiter and Uranus, will be apparently remarkably close together on and about the 9th and 10th. (Those who like may imagine that some disaster or good fortune will occur on the earth on this account.)

The occultation of Saturn on the 11th, at 9.27 a.m., will be visible only north of the 18th parallel of latitude. An occultation of Theta Librae, at about a quarter to 5 a.m. on the 11th, will be visible below the 27th parallel. On the 19th Mercury will be in inferior conjunction with the Sun, but 5 degrees above it, at noonday, instead of exactly between us and the great luminary. On the 20th, at 5 a.m., the Moon will be passing Jupiter eight times its own diameter above it. The small stars of Pisces will be hardly observable as a background.

A conjunction of Mercury and the Moon will take place a second time this month, at 3 o'clock in the morning of the 28th, when both are below the horizon. Mars also will have a second conjunction, on the 31st, but at an hour not suitable for observation.

6	Aug.	☾	First Quarter	4 5 a.m.
13	,,	○	Full Moon	2 37 p.m.
20	,,	☽	Last Quarter	5 54 a.m.
27	,,	●	New Moon	4 45 p.m.

Apogee 4th August, at 4 18 a.m.
Perigee 16th August, at 1 42 a.m.
Apogee 31st August, at 9 12 p.m.

Mercury will be at its greatest brilliancy on 5th August. On the 6th Saturn will be stationary and in the head of the scorpion. The apparent nearness of Saturn and Beta Scorpii to the Moon on the 7th will be interesting to observe as soon as twilight permits these three bright objects to become clearly discernable high up in the north.

For places west of Warwick and nearly in the same latitude, 28 degrees 12 minutes S., add 4 minutes for each degree of longitude. For example, at Inglewood, add 4 minutes to the times given above for Warwick; at Goondiwindi, add 8 minutes; at St. George, 14 minutes; at Cunnamulla, 25 minutes; at Thargomindah, 33 minutes; and at Oontoo, 43 minutes.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhat about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

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